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## INVESTIGATIONS

# In Chicago, handguns turned into high-capacity machine guns fuel deadly violence

October 28, 2022 · 5:00 AM ET

Heard on Morning Edition

By Frank Main, Tom Schuba, Matt Kiefer, Cheryl W Thompson

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Chicago police officers arrive at the scene of a May 19 mass shooting outside a McDonald's restaurant.

Tyler Pasciak LaRiviere/Sun-Times

Kimberly Saunders was grabbing a gyro at a restaurant just blocks from the upscale Magnificent Mile commercial district near downtown Chicago in May when she heard rapid fire gunshots around 10:30 p.m.

"I feel like I heard 20 shots," she recalled. "I used to watch these war movies as a kid, so it sounded like one of those machine guns."

The shots came from outside a nearby McDonald's restaurant, prompting Saunders to go down the street to find out what happened. What she discovered horrified her: Sprawled on the sidewalk in a pool of blood was her 17-year-old son, Parnelius. He had been shot multiple times in his arm, shoulder and back as he walked home from the beach.



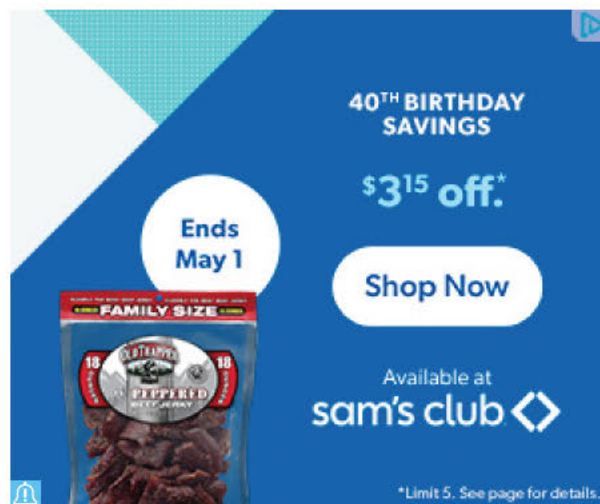
"Oh, my God, I just walked up there on my son bleeding out," Saunders said. "So I took my shirt off, and I begin to put my shirt over his wounds."

Parnelius Saunders survived. Police and prosecutors said Jaylun Sanders, 22, shot him and eight others. Two of the victims died. The shooting was related to a fight 20 minutes earlier, police said.

The firearm used was a Glock 19 handgun that had been converted to an illegal high-capacity machine gun with a device known as an auto sear, a square device about the size of a thumbnail. It's known on the street as a "switch" that turns the gun from a semi-automatic to an automatic weapon.

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The Glock came with an extended magazine, making the weapon even deadlier. The magazine held 34 rounds, according to court records. Sanders told authorities he bought the gun in Indiana and the switch for less than \$25.

Despite a longstanding federal ban on auto sears, and a ban on extended magazines in Chicago and surrounding Cook County, the number of guns with the illegal



attachments being seized by the city's police department has surged in the last several years, an investigation by the *Chicago Sun-Times*, WBEZ and NPR has found.

The investigation found that:

- The number of extended magazines — those with more than 10 rounds — recovered by Chicago police more than doubled from 2018 to last year, up from 459 to 924, records show.
- Chicago police have recovered extended magazines in at least 13 mass shootings since 2018. Eleven of the 13 were in the last two years.
- The number of auto sear-equipped handguns seized by Chicago police skyrocketed from zero in 2018 to 355 last year, leading federal authorities to declare that Chicago has one of the worst switch problems in the country.
- Since 2018, Cook County prosecutions of auto sears and extended magazines — machine-gun prosecutions — increased from six in 2018 to 201 last year.

The issue of guns and their accessories is being hotly debated by lawmakers across the country. Earlier this month, the U.S. Supreme Court upheld a ban on bump stocks, which make a semi-automatic rifle such as an AR-15 fire faster. And in Congress, legislators have been going after so-called ghost guns, which are made privately and can't be traced.





Similarly, the proliferation of switches is a nationwide issue. The number of switches recovered by the Bureau of Alcohol, Tobacco, Firearms and Explosives rose from 100 in 2017 to about 1,500 last year, according to Whitney Cruse, a special agent and spokesperson for the ATF's Washington Field Division.

"They are going up because they're more accessible," said Cruse. "People are making them now from 3D printers."

Virtually every handgun available to the public at licensed gun stores is semi-automatic, meaning the shooter needs to squeeze the trigger every time a shot is fired. When a semi-automatic handgun is turned into an automatic with a switch, the bullets will continue to fire as long as the trigger is squeezed and held. With an extended magazine, shooters can unload 20 rounds from a modified Glock in about a second, according to James Barlow, a firearms enforcement officer with the ATF.

Mass shootings have grown more commonplace in Chicago, and some blame it on the uptick of the makeshift machine guns.

"I think Chicago has, of course, a lot of gang violence, sadly, so the gangs are well-informed about options when it comes to firepower," said Philip Cook, a Duke University economist who has studied gun violence prevention for more than 40 years.

The auto sears work on myriad handguns, but Cook said the illegal machine guns are especially attractive to gang members because they're more effective in accomplishing their mission — to shoot and kill.

"There's an advantage if you're at war to be able to deliver a lot of rounds quickly," he said.



A billboard for rapper PGF Nuk's latest album, titled *Switch Music*, in the Bridgeport neighborhood of Chicago this summer.

*Pat Nabong/Sun-Times*

Gang members also clamor for the makeshift devices because they're easily concealable in a waistband or coat, unlike a rifle.

The Glocks with auto sears have also become a status symbol on the streets. Chicago rapper PGF Nuk titled his latest album *Switch Music*.

**Made in China — with instructions available online**

Many of the switches seized with handguns in Chicago were made in China, according to federal officials. They're marketed online for other purposes, such as attachments for replica "airsoft" guns that fire plastic projectiles. Those switches are metal. The ones made with 3D printers, often in homes, are less durable plastic. The instructions for attaching the switches to a handgun are easily available online.

In some cases, police have found that gang members modified handguns themselves. Other times, they buy handguns preassembled with switches.

If an extended magazine doesn't come with the gun, those, too, are readily available. Anyone can buy one at gun shops and sporting goods stores outside of Cook County without needing a special permit. They're not outlawed in neighboring Indiana or Wisconsin, or many Illinois municipalities.

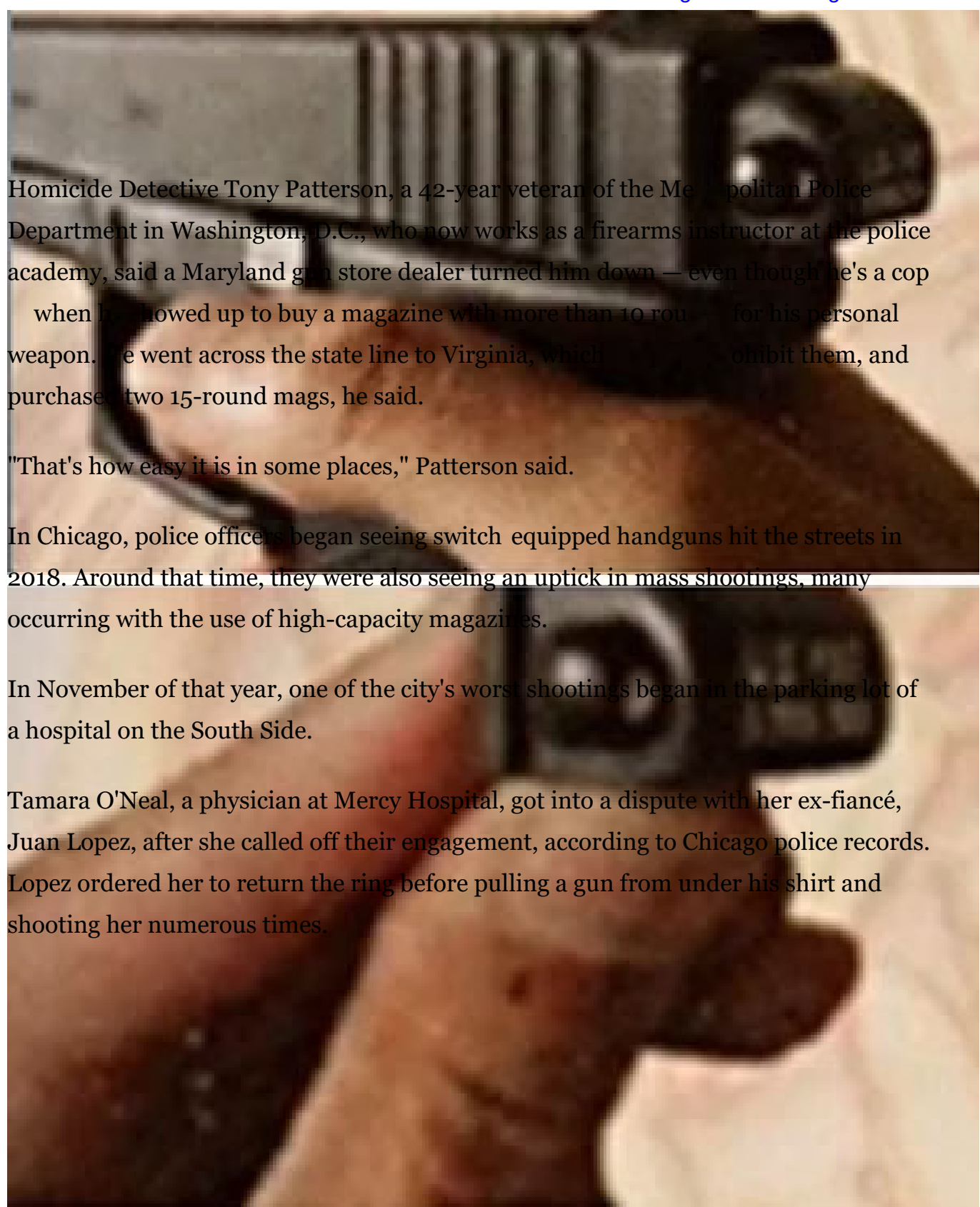
Like in Cook County, high-capacity magazines are banned in the nation's capital and 12 states including Maryland, Colorado, California, Massachusetts and New York. In some of those states, it's illegal to have a magazine that can hold more than 10 rounds; in others, more than 15.

But with no federal restrictions in place, most states have no limits on magazine capacity.

Switches, on the other hand, are illegal under federal law.







Homicide Detective Tony Patterson, a 42-year veteran of the Metropolitan Police Department in Washington, D.C., who now works as a firearms instructor at the police academy, said a Maryland gun store dealer turned him down — even though he's a cop — when he showed up to buy a magazine with more than 10 rounds for his personal weapon. He went across the state line to Virginia, which prohibits them, and purchased two 15-round mags, he said.

"That's how easy it is in some places," Patterson said.

In Chicago, police officers began seeing switch equipped handguns hit the streets in 2018. Around that time, they were also seeing an uptick in mass shootings, many occurring with the use of high-capacity magazines.

In November of that year, one of the city's worst shootings began in the parking lot of a hospital on the South Side.

Tamara O'Neal, a physician at Mercy Hospital, got into a dispute with her ex-fiancé, Juan Lopez, after she called off their engagement, according to Chicago police records. Lopez ordered her to return the ring before pulling a gun from under his shirt and shooting her numerous times.



As Lopez entered the hospital's emergency room, he exchanged gunfire with police, shooting a 25-year-old pharmacy technician who emerged from an elevator and a 28-year-old police officer who had been on the force for less than two years. Both died. Police then shot Lopez in the chest before he fatally shot himself in the head.

He fired at least 30 rounds from his gun, according to police records. Lopez had licenses to own and carry a firearm and was found with three high-capacity magazines that could hold 17 cartridges each, records showed.

Since then, police have recovered an increasing number of guns with auto sears as well as extended magazines. At the same time, machine-gun prosecutions and mass shootings have risen.



Glenda O'Neal is helped by family members as she walks out from the church after funeral services for her daughter Tamara O'Neal at the First Church of God in La Porte, Ind., on Nov. 30, 2018. Dr. Tamara O'Neal, 38, was one of three people shot at Mercy Hospital and Medical Center in Chicago.

*Zbigniew Bzdak/Tribune News Service via Getty Images*

In September, two people were killed and seven wounded in Chicago's Washington Park in one of those mass shootings. Police have said dozens of shell casings were recovered and they believed an automatic weapon was used.

Law enforcement officials in Chicago said they've stepped up efforts to combat the sudden popularity of makeshift machine guns. In federal court, cases involving switches are resulting in stiff prison sentences for some convicted dealers.

Last August, Leonard Johnson, who was left paraplegic as a result of a 2008 shooting, was sentenced to 10 years in prison after being convicted on charges of supplying four Glock switches to someone who sold them to an undercover officer and an informant.

In December 2020, federal authorities searched Johnson's home in a Chicago suburb and found 117 switches and three handguns converted into machine guns. They also seized another handgun, a silencer, three extended magazines and ammunition. While he was out on bail, he continued to traffic firearms and Glock switches, prosecutors said.

Johnson, 34, pleaded guilty to illegal firearms dealing and illegal possession of a machine gun.

In a June 28 court filing seeking a 12-year sentence for Johnson, federal prosecutors cited "the difficulty of controlling the multiple rounds being expelled in short bursts by a handgun."

"Sadly, [Johnson] is both a victim of gun violence and, by selling machine guns, a perpetrator of gun violence," the prosecutors said.

Javaughn Hixson, 23, of Rockford was sentenced to more than five years in prison on Aug. 25 for possessing Glock switches — four that he sold to an informant. The federal judge in that case gave a blistering assessment of the impact of the devices.

"The sole and exclusive purpose of Glock switches, which are easily manufactured, is to convert an already dangerous firearm into an extremely dangerous machine gun," U.S. District Judge Iain Johnston said in his written sentencing order. "The dangerousness manifests itself not only in the sheer number of bullets that can be emptied from the magazine in the blink of an eye but also in the resulting lack of control of the firearm when discharging it."

## Technology brings back the machine gun



On April 19, 1929, Lt. Col. C.H. Goddard (left) and coroner Herman N. Bundesen look over machine guns believed to have been used in the St. Valentine's Day massacre, which occurred on Feb. 14, 1929, in Chicago.

*Herald & Examiner/Tribune News Service via Getty Images*

A special federal license is needed to own a machine gun in the U.S. That requirement was put in place under the National Firearms Act, signed in 1934 by President Franklin D. Roosevelt. The aim then was to get Tommy guns out of the hands of criminals who were carrying out mass shootings, such as the infamous St. Valentine's Day massacre in Chicago in 1929. Seven rivals of gangster Al Capone were gunned down in the now affluent, white-collar Lincoln Park neighborhood on the near North Side.

Under that act, individual switches — even those that aren't attached to a gun — are considered machine guns. The penalty for breaking that law is up to 10 years in prison.

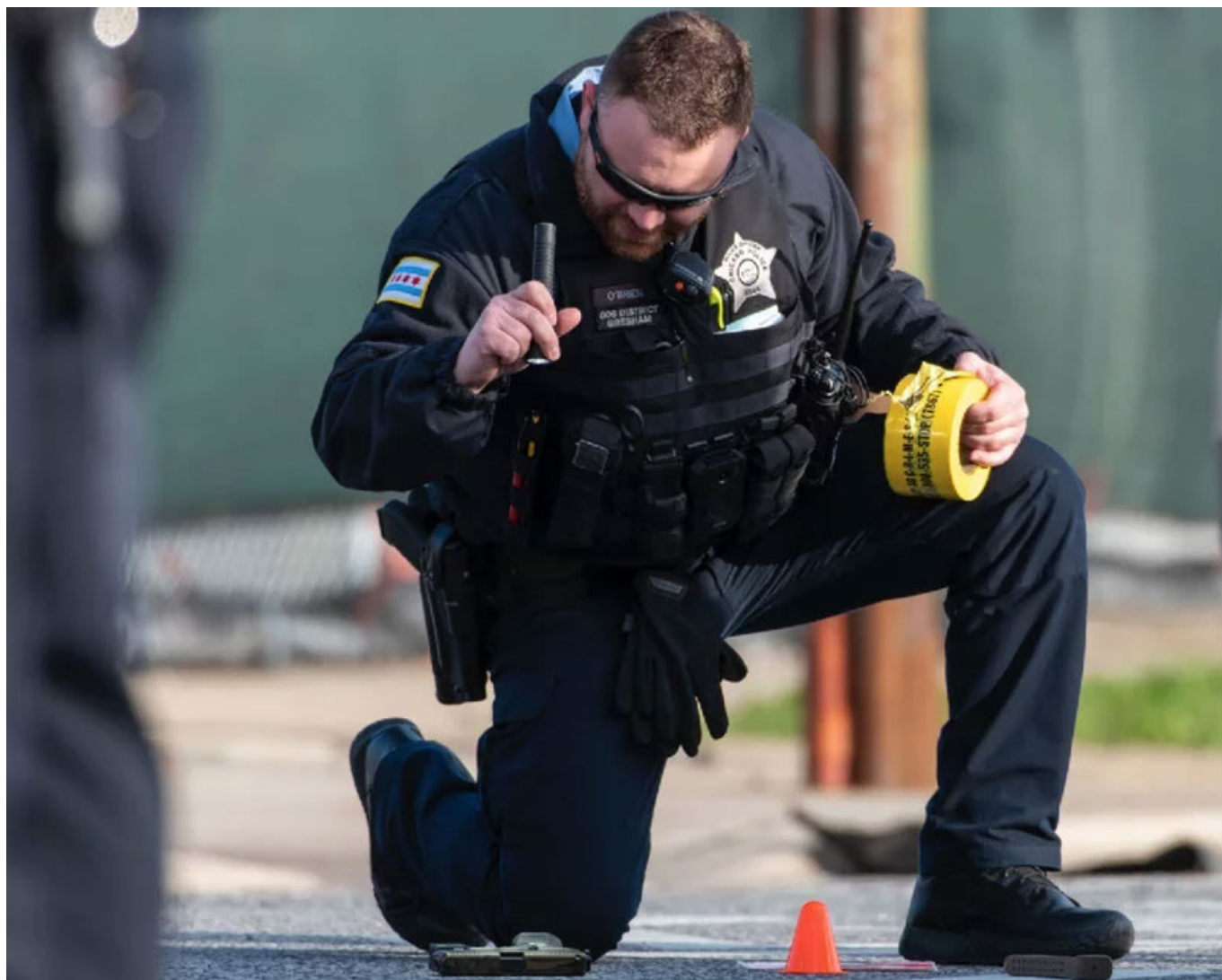
As federal authorities try to address the growing, nationwide switch problem, the emergence of widely available technology that allows traffickers to produce the switches using 3D printers has made it even harder.

"We're kind of in a transition period," said Barlow, who oversees an ATF unit that trains new firearms enforcement officers. "It used to be we would see a lot of the imported-style switches [from China], but the 3D printing stuff actually is becoming more prevalent. We're probably close to a 50-50 mix between the two right now."



Aside from intercepting 3D-printed switches through the mail or pulling them off the street, Barlow said officials have few ways to respond to the homemade devices.

New types of switches are hitting the underground market, too. The "invisi-switch" looks nearly identical to the slide that covers the barrel of a legal, semi-automatic Glock, Barlow said. Traditional switches, on the other hand, are easier to spot: The thimble-size devices stick out of the back of a handgun.



A Chicago police officer examines a Glock handgun found May 4 in the 8200 block of South Halsted Street where a 20-year-old man was shot and wounded. According to police records, the gun was equipped with an automatic switch and extended magazine. No one has been charged in that shooting.

*Tyler Pasciak LaRiviere/Sun-Times*

In 2019, when switches started gaining popularity in Chicago, ATF began working with Homeland Security Investigations, U.S. Customs and Border Protection, and the U.S. Postal Inspection Service on two global task forces targeting switches. One of their



investigations, dubbed Operation Silent Night, also goes after extended magazines and gun silencers or suppressors.

Barlow said that Chicago has one of the worst switch problems in the country.

The switches made in China are sometimes sold online as kitchen utensils, carburetor parts or components for pellet guns, Barlow said. Once they get to the United States, they're sold within criminal networks in a similar fashion to the illegal drug trade.

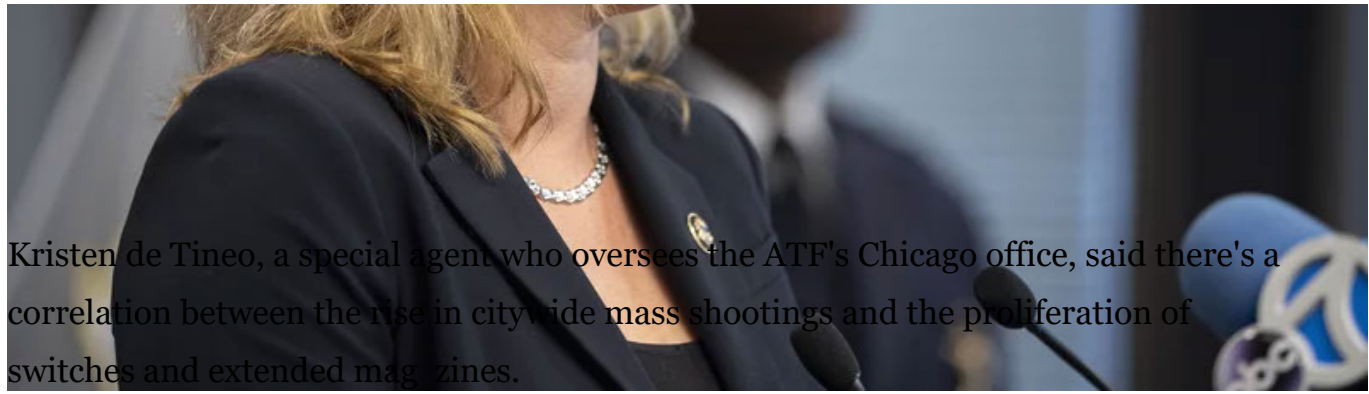
Sean Fitzgerald, acting special-agent-in-charge of the Homeland Security Investigations' Chicago office, said his agency has identified "multiple regions" in China where switches are manufactured. In many cases, the manufacturers quickly dissolve after coming under scrutiny, only to be replaced by others, he said.

Fitzgerald said his agency has been working with Chinese counter-smuggling officials in an effort to target those operations and advance some of the roughly 650 investigations that Homeland Security has launched into switches, extended magazines and silencers.

"China will share that information and work those investigations with us to either shut down the manufacturers or to provide the evidence back so we can prosecute," Fitzgerald said.

He said HSI's role is to retrace shipments related to switches, extended magazines and silencers found during investigations of shootings in Chicago. The federal agencies work closely with Chicago police.





Kristen de Tineo, a special agent who oversees the ATF's Chicago office, said there's a correlation between the rise in citywide mass shootings and the proliferation of switches and extended magazines.

"It's a logical assumption that the more ammunition that can be fired more quickly, the more victims who are at risk," de Tineo said.

As switch-equipped guns and extended magazines have grown more popular, there's also been "a great increase" in the number of shell casings found at shooting scenes in Chicago, according to Brendan Deenihan, the Chicago Police Department's chief of detectives.

"If a guy's pulling a trigger and ripping off 25 rounds, and there's a group of people nearby, more people are going to get hit, [there are] more casings to recover and just more damage being done in general," Deenihan said.

Chicago police Officer Danny Golden was shot earlier this year after he tried to break up a fight at a neighborhood bar on the city's far Southwest Side. Golden was paralyzed in the shooting.

Nineteen shell casings from a .40-caliber weapon were found at the scene, court records show. The suspected gunman was later found with an automatic .40-caliber Ruger pistol with a 30-round extended magazine, police said.

"I think it's challenging for the detective division to investigate these crimes," Deenihan said. "And I think it's just extremely dangerous for the officers that are out there, and obviously the citizens that are out there, that are not part of these ongoing shooting problems."



Chicago police Officer Danny Golden is released from the Shirley Ryan AbilityLab and escorted home by the Chicago Police Department on Aug. 19. Golden was paralyzed when he was shot trying to break up a fight at a neighborhood bar earlier this year.

*Antonio Perez/Chicago Tribune/Tribune News Service via Getty Images*

In July, Democrats introduced legislation in the U.S. Senate to establish "a coordinated national strategy to prevent or intercept the importation and trafficking of automatic gun conversion devices."

"Gun violence is an epidemic and lawmakers must do all we can to combat this horrific threat — including by stopping the flow of illegal gun modification devices into our country," said Sen. Gary Peters, D-Mich., a lead sponsor of the bill.

Kristen Rand, a spokeswoman for the D.C.-based Violence Policy Center, a nonprofit that advocates for gun control, said it's too late for lawmakers to halt switches from entering the country.

"The focus should be on why so many firearms are so easily converted to full auto," she said. "Manufacturers must bear some of the responsibility to design their guns to be more resistant to conversion."

Rand says ATF should consider using its authority to reclassify certain types of firearms that are easily converted into fully automatic weapons, similar to what they did in the 1980s with the KG-9 and the MAC-10. Lots of firearms besides Glocks also are "readily convertible" into machine guns by using tools to reconfigure them or adding parts, she said.

At least 643 of the 706 modified weapons recovered by the Chicago police between 2018 and last month were Glock handguns, records show. A spokesperson for Glock didn't respond to a request for an interview or written questions.

Saunders, who said her son, Parnelius, is recovering from the shooting and has returned to his special needs school, said she was surprised to learn that he was shot by a handgun illegally converted to a machine gun.

"It's very unfortunate that civilians are able to get hold of that type of artillery," she said. "It's really sad. And it's really scary."

*This story is a collaboration from NPR's Station Investigations Team, which supports local investigative journalism, member station WBEZ and the Chicago Sun-Times. Frank Main and Tom Schuba cover crime for the Chicago Sun-Times. Matt Kiefer is the data editor for WBEZ in Chicago.*

*Chip Mitchell, a criminal justice reporter for WBEZ, Charmaine Runes, a data/visuals reporter for WBEZ, and Robert Benincasa, a senior producer for investigations at NPR, contributed to this story.*

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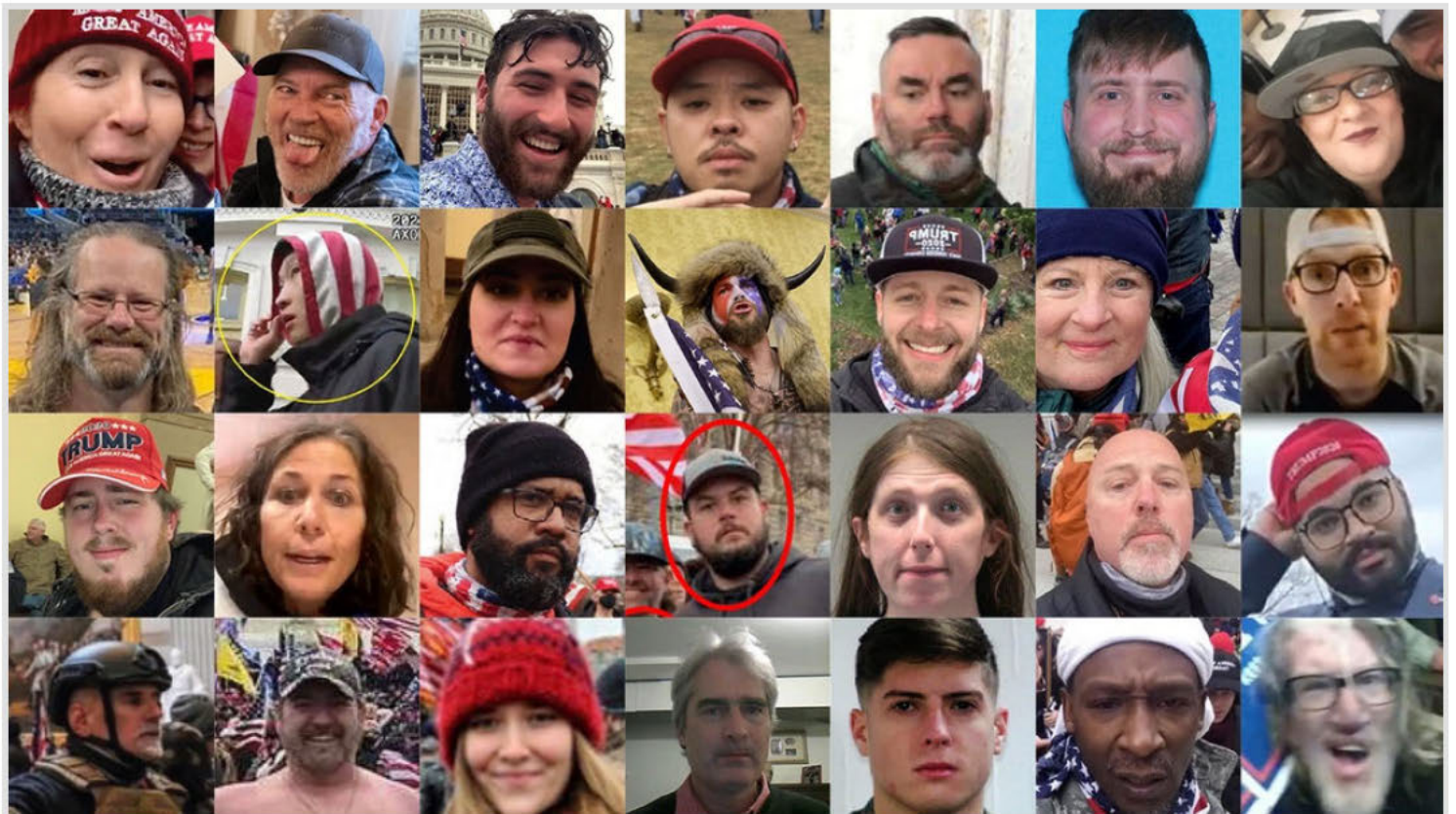
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# EXHIBIT 97



## ARTICLE

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OPEN

# Guns on social media: complex interpretations of gun images posted by Chicago youth

Desmond U. Patton<sup>1\*</sup>, William R. Frey<sup>1</sup> & Michael Gaskell<sup>1</sup>

**ABSTRACT** How should we interpret gun images on social media? Take for example the shooting at Stoneman Douglas High School. Media articles revealed that the gunman, a white adolescent male, posted images of firearms and other weapons on his social media profile prior to the shooting. On the other hand, when it comes to Black communities, digital policing strategies often intercept images with guns and individuals thought to be associated with gangs before a crime is ever committed. In this study, we use a mixed methods approach, situated in social systems theory, to make meaning of gun posting behavior among Black youth who associate with gangs in Chicago. We collected and examined a corpus of Twitter images (1851) through snowball sampling of a well-known deceased gang member in Chicago and users in their Twitter network. We identified 560 images that contain guns and asked two distinct groups to annotate images: formerly gang-involved outreach workers, known as community domain experts, at a local Chicago violence prevention organization and Master of Social Work students at Columbia University. After comparing their results, findings highlighted the prevalence and frequency of gun image posting within this corpus and critical differences in how community domain experts and social work annotators perceive guns. The various underlying intents provide a rich source of knowledge for understanding the symbolic nature of guns in the digital age.

<sup>1</sup>Columbia School of Social Work, 1255 Amsterdam, New York, NY 10027, USA. \*email: [dp2787@columbia.edu](mailto:dp2787@columbia.edu)

## Introduction

In recent years, social media has become an ecological environment or neighborhood (Stevens et al., 2017), where digital scripts and narratives convey a wide range of emotional attributes among them happiness, love, trauma, and pain. For young people living in communities with high rates of gun violence, social media becomes a *digital street* where taunts, arguments, and threats may play out over Twitter conversations or Facebook live feeds—the study of which elucidates how physical neighborhood conflicts unfold and who is involved (Lane, 2018). Recent research findings from the burgeoning cyberbanging literature indicate that using computational tools to identify handguns in Twitter communications is an important method of detecting signals of aggression from Black gang involved youth in Chicago (Blandfort et al., 2019). However, when interpreting behavior from Black communities, the presence of guns may supersede the context in which an image exists. Thus some viewers may tend toward erroneous or inaccurate conclusions, weave them into a narrative, and potentially identify them as a proxy if building a case for premeditation in future legal proceedings (Patton et al., 2017).

While computational tools offer new ways of understanding the links between social media communication and gun violence, there are real concerns about the potential for misinterpreting images on social media in the absence of sufficient context. Interpreting gun images within a networked public comprised of highly visible social media content offers a unique set of challenges. Balancing real world safety risks and the potential for mass surveillance and emerging technologies to reproduce existing inequities raises concerns regarding the “New Jim Code” (Benjamin, 2019). Focusing on youth living in communities with high rates of gun violence, Patton and colleagues (2017) argue that youth may discuss or post pictures of guns as a way to posture and display digital gravitas, rather than having real intent to carry out gun violence. While scholarly literature provides rich description of why persons may choose to carry guns (May, 1999; Watkins et al., 2008; Watts, 2019; Wilkinson and Fagan, 2001), little research examines when and why guns appear in social media posts. Community insights (e.g., backstories, language, and general context) into the reasons young people post gun images on social media also receive limited attention or acknowledgment in this literature.

This study examines the 2012–2017 gun image posting behavior of Black youth—including some who self identify as gang involved—who live in Chicago neighborhoods that have high rates of gun violence. We intentionally wrestle, and to some extent struggle, with the concern that online pictures of guns juxtapose racialized scripts and narratives that may frame how pictures of Black boys with guns are interpreted in the broader criminal justice context. We review extant literature on the relationship among guns, gangs, and social media, and then address three primary questions: the frequency, prevalence, and type of gun images posted among Black youth in Chicago; gun image posting behaviors and the extent to which they are gendered; and a description and comparison of community domain experts’ and social work annotators’ perceptions of aggression in images with guns.

## Literature review

**The relationship between guns and gang-related homicides.** In an examination of U.S. gun homicides between 1980 and 2008, Cooper and Smith (2012) found that gang related homicides were more common than those committed as a result of interpersonal disputes or another type of crime. In contrast, of all non gun homicides during the same period, gang homicides were less

common than all other contexts. Gun deaths of gang involved individuals compared to non gang involved individuals in the United States are markedly disproportionate. The Geneva Small Arms Survey (2011) estimated that the murder rate for gang members was 893.4 per 100,000 residents, compared to 5.7 per 100,000 residents for the general population. Living in a neighborhood with high rates of violence increases the risk of joining a gang, exposure to violence, and becoming a victim of homicide (Merrin et al., 2015; Santilli et al., 2017). Furthermore living in such a neighborhood increases the likelihood of owning or having access to a gun (Roberto et al., 2018). Still, inquiry into the possession and use of firearms among gangs is a critically important area of public health research.

Though precise estimates of gun ownership among U.S. street gangs vary, surveys have consistently found that gang involved individuals own firearms at a higher rate than their non gang affiliated peers (Bjerregaard and Lizotte, 1995; Decker et al., 1996; Wilkinson, 2003). Surveys of gang involved and gang affiliated people have yielded varied reasons for owning firearms. As mentioned, one common reason is to protect oneself and maintain a sense of personal safety while navigating dangerous neighborhoods (Wilkinson, 2003). Further, gang involved individuals are more likely than non gang involved individuals to engage in illegal behaviors (Alleyne and Wood, 2010; Klein and Maxson, 2010; O’Brien et al., 2013) and may more frequently encounter situations of heightened risk to personal safety (Wright et al., 1993). Symbolic aspects may also play a role in gun ownership, among them using a gun to establish status or to project a violent identity (Stretesky and Pogrebin, 2007). Ultimately, gun ownership or access represents a crucial factor in the prevention of gun violence.

**The role of social media in gang violence.** Pyrooz and colleagues (2015) interviewed current gang involved individuals from five major U.S. cities and found a rate of internet use equal to that of their non gang involved peers. While there is some debate regarding whether gang involved individuals use the internet for sophisticated criminal enterprises (e.g., phishing schemes) or instrumental activities (e.g., direct gang recruitment), there is evidence that this behavior is uncommon among U.S. street gangs (Pyrooz et al., 2015). There is, however, a tendency for gang involved individuals to engage in deviant and illegal online activities, such as illegally downloading music, and selling drugs (Pyrooz et al., 2015).

A growing area of concern among community groups and law enforcement is the practice of *internet banging* (Patton et al., 2013). Internet banging broadly includes online communications that promote gang affiliation, communicate threats, and share information about rivals to sympathetic local or national groups. These online communications, which are often inflammatory, disrespectful, and threatening toward rivals, have been blamed for inciting real world violence (Patton et al., 2018a). Where gang conflict in the past may have escalated due to face to face encounters, the immediacy of online communications may result in increased conflict and escalation (Patton et al., 2018a). Patton and colleagues (2016a) interviewed individuals who work for community violence interruption groups and found that social media plays an increasing role in escalation of conflict between rival gangs. Outreach workers identified several behaviors that increased the likelihood of violent confrontation, including taunting (e.g., posting a video of oneself on another group’s “turf”), disrespecting another group’s symbols (e.g., throwing down or inverting a rival’s hand sign), and disrespecting fallen rivals (Patton et al., 2013).

While these digital practices certainly lead to conflict and increased intergroup tension, they also provide an opportunity. Community outreach workers can maintain awareness of the ongoing conflicts and issues that arise between individuals and groups. In some cases, outreach workers who have the trust and respect of the community can directly engage with individuals and groups through social media to work toward a resolution. Due to the volume of online communications and the nearly impossible task of monitoring all possible sources of conflict, efforts are being made toward developing machine learning tools to automatically identify predictors of online violence to render community outreach efforts more effective (Blandfort et al., 2019; Blevins et al., 2016; Chang et al., 2018).

The specific online behaviors that predict real world violence are not fully understood, though qualitative analysis of gang involved youth's Twitter communications reveals aggressive themes as a potential source of escalation between groups (Patton et al., 2013). Loss and grief likely also play a role: there is a well described cycle of violence in which gang murders occur in retaliation for a previous murder. Evidence of loss related tweets predicting aggression related tweets further suggests the importance of understanding expressions of loss as a potential antecedent to gun violence (Patton et al., 2018b). Aside from identifying real time conflict, community, and law enforcement gang violence prevention strategies encompass a broad range of strategies including preventing initial gang involvement, suppressing gang activities, and using criminal justice strategies (Gravel et al., 2013). A recent report suggests that targeting areas with high rates of violence and removing illegally possessed firearms is also an effective strategy in reducing gang associated gun violence (Webster et al., 2018). However, strategies that overlook systemic issues impacting who experiences gun violence may overlook a potential relationship between root causes of violence and gun violence prevention strategies. In the next section, we use social systems theory to better understand how sociohistorical influences may shape current gun posting behaviors on Twitter.

**Social systems and blackness.** Understanding gun image posting behaviors of Black youth who live in neighborhoods with high rates of gun violence requires critical consideration of the social systems in which these behaviors take place. Without considering social systems and the sociohistorical ways in which Blackness is criminalized and perceived as a constant threat, social media interpretations can and have reinforced racist, reductionist explanations, and narratives to explain Black youth's social media behaviors (Lane, 2018). Crawford and Calo's (2016) social systems approach to artificial intelligence (AI) development and research describes a process that asks questions about the impact and effect of systems on both people and AI. Expanding this approach beyond AI systems provides a framework for examining the impact of harmful behavioral classification of the social media posts of Black youth. These youth in particular often experience compounded systematic marginalization, and their lived experiences are often extracted and decoded using AI systems.

A social systems approach requires expansive inquiry and questions that take into account the systems and processes influencing Black youth behaviors. This approach also focuses on humanizing people who are often dehumanized, especially young people who may be gang involved or affiliated (Frey, 2018). Rather than solely considering personal reasons for posting images of guns on social media, the social systems approach pushes us to understand how systems of violence could influence pressures to display a tough persona online. Further, this approach allows researchers to prioritize ending gun violence, while carefully navigating concerns such as new technologies used

to enforce the New Jim Code (Benjamin, 2019); further embedding surveillance capitalism in the fabric of society (Zuboff, 2019); and enhancing the sociopolitical and historical surveillance of Blackness (Browne, 2015). As Browne (2015) states, "How is the frame necessarily reframed by centering conditions of blackness when we theorize surveillance?" Otherwise put, how do our inquiries shift when we contextualize race as a sociopolitical system that leads to marginalization and hypersurveillance of Black communities? These questions must be central to any analysis of social media posting behaviors of Black youth. We must ask what various social systems impact Black youth who post images of guns on their own (at times, identifiable) social media profiles?

Extending the social systems approach, Frey and colleagues (2018) identified the necessity of involving community/domain experts in research processes as well as the development and oversight of computational systems. There are limitations to the efficacy of employing a social systems approach focused on broader questions and furthering our own understandings of gun images on social media, unless we holistically involve, at every stage in the process, the people being studied.

### The current study

In this study, we examine three broad topics: (1) the prevalence of gun images in, and frequency with they appear, in our Twitter corpus; (2) gun image posting behaviors on social media among gang involved or gang affiliated individuals in Chicago; (3) and how the presence of guns in images influence community domain experts and social work annotators' the perception of aggression. We conclude by wrestling with how guns are interpreted by situating our work in sociological research that examines how offline behavior, symbolism, and impressions shape digital post ing practices in an ecology of violence.

### Methods

**Sampling and data collection.** The data used in these analyses come from a broader research effort related to online communications among young people from marginalized communities in Chicago. The sample contains tweets collected in two phases. Table 1 provides a summary of the two resulting datasets.

The primary dataset is comprised of publicly available tweets for 274 individuals believed to be gang involved or gang affiliated in Chicago. To obtain 274 users, we used a snowball sampling technique a commonly used method in sociological research when recruiting members of a group through random sampling is unfeasible (Atkinson and Flint, 2001). Our seed user was female, a well known Chicago gang member, and a prolific Twitter user who was killed in April 2014. We added to the sample Twitter users who were top communicators with the seed user and those who were top communicators with them. In February 2017, we collected each of the 274 users' previous 200 tweets for a total sample of 52,053 tweets. Due to the infrequency of tweeting among some users, the earliest tweets came from as early as October 2012; however, 85% of tweets fell within one year of the sampling date, and 50% within a month of the sampling date.

The second phase of data collection involved sampling 20 additional publicly available original content tweets with images per user for an original user subset of 167. After removing duplicates from the primary dataset, this second phase resulted in 1856 additional tweets ranging from July 2013 to February 2017. Over 90% of the secondary dataset tweets originated within one year of the date on which data was obtained; approximately one quarter of tweets originated within one month of the sample date. Our interest was the behavior of displaying gun images online, we filtered the primary dataset to remove tweets without images.



Table 1 Descriptive summary of twitter datasets		
	Primary	Secondary
Type	Original and retweeted content, tweets with images, text-only tweets	Original content, tweets with images
Number of users	274; Snowball sample from gang-involved, well-known seed user	167; Curated subset of primary dataset, most recently active users
Total tweets sampled	52,053	1856
Total image tweets	4104	1856
Inaccessible image tweets	576	446
Accessible image tweets with gun in any context	392	169
Original gun images	184	169
Retweeted gun images	208	0
Analysis	Overall frequency, gun image description, thematic frequencies	Gun images description, thematic frequencies, comparison of academic and local domain expert thematic perceptions

This resulted in 4104 tweets with images which, combined with 1856 image tweets from the secondary dataset, provided a total of 5960 image tweets.

Due to the dynamic nature of social media data, user profiles, tweets, and images became unavailable over the course of the coding process. The reasons for unavailability were not always immediately known, but causes included changes to usernames, changes to privacy settings, suspension of profiles, and deletion of profiles. By the end of data analysis, 576 of the primary image tweets and 446 of the secondary image tweets were no longer available. Missing data due to unavailability of profiles is described whenever applicable throughout the results. To protect the identities and privacy of Black youth in our corpus, we do not include images in this paper (Tweet IDs for the data may be made available to researchers who sign a memorandum of understanding specifying their intended use of the data and their agreement with our ethical guidelines).

**Image coding.** The authors coded all image tweets for the presence of a firearm in any context. We then coded all firearm images on concrete variables of interest related to the image (e.g., number of guns, size of magazine, etc.), which we describe in more detail below. Thematic codes for the two datasets follow the convention of previous research within this population and include four categories: aggression, loss, substance use, and “other” (Blevins et al., 2016; Patton et al., 2016a). We applied thematic codes through an intensive, contextually driven annotation process. Next, two social work student annotators, who had more than 100h of coding and labeling experience in this broader dataset, each provided thematic codes for all images in the secondary dataset. Disagreements were reconciled through a reconciliation process with a senior member of the research team. For gun image tweets not included in the secondary dataset, the senior researcher provided a thematic code.

Additionally, all image tweets from the secondary dataset were coded by domain experts from the local community. The domain experts were African American, one man and one woman in their early to mid twenties. Both domain experts were employed as outreach workers at a local Chicago violence prevention non-profit organization. The domain experts were selected because of past experience with gun violence, use of social media as an outreach tool, and general interest in the research study. Domain experts coded social media content based on their lived experience, gun violence expertise, and social media behavior of youth in their community. The domain experts did not receive the same training as social work annotators, or our analysis methods, because their lived experience was viewed as ground truth and true expertise (Frey et al., 2018).

We include domain experts from local communities in our work to help improve coding accuracy and minimize bias (Frey et al., 2018). The parallel coding process (lab annotators and domain experts) allows an exploratory analysis of the impact of gun presence in tweets. It also allows a comparison between perceptions of lab annotators who despite a deeper than average understanding of the target population do not live in the context of the tweets and community based domain experts, who live in the context and have a deep and nuanced understanding of places, people, and things in the images. Due to the non experimental nature of this dual coding process, these findings will be treated similar to a case study and only potential trends will be discussed.

**Variables.** Tweets were coded on three domains: general aspects of the tweet or image that did not pertain directly to the firearm; attributes and behaviors regarding the pictured firearms; and the thematic content of the tweets.

*General tweet attributes.* We coded tweets on several general attributes including the date of the tweet, whether the tweet was original content or a retweet, and the type of image depicted (e.g. photograph, meme, etc.). To explore gender based differences in behaviors, we also coded each tweet according to the tweet author’s apparent gender. Since gender is usually not explicitly stated on Twitter, we determined gender was based on stereo-typical hairstyles, clothing, and pronouns used. We only coded images on this variable when the gender of the user could be determined with high confidence.

*Gun attributes and gun behaviors.* Precise classification of fire-arms is difficult, given the absence of a clear classification system. As such, we coded firearms as simply semi automatic, revolver, and rifle. We also coded the size of the handgun frames as either standard or compact. Since there is disagreement regarding what constitutes a full sized versus compact pistol frame, handguns were usually considered full sized unless a markedly small frame was observed. However, in instances where the brand and model name were visible, the frame’s designation in the company’s marketing materials was used to classify the firearm as standard or compact. For magazine fed handguns, magazine type was determined as standard, extended, or drum. The convention used for classifying magazines set standard magazines as flush or within two finger widths of the bottom of the pistol grip, extended magazines as straight and extending beyond this length, and drum magazines as containing one or two cylindrical feeding mechanisms. The specific behavior depicted with the gun was also coded. Categorical codes were developed through qualitative analysis of a subset of the data and are described in more detail



**Table 2 Gender differences within the dataset**

	Men	Women	$\chi^2$	Df	p	Unavailable	Undetermined	Total
Entire sample	155 (53.3%)	54 (18.6%)	48.809	1	<0.001	67 (29%)	15 (5.2%)	291
Valid %	74.2	25.8						
Users who post guns	92 (57.5%)	19 (11.8%)	4.442	1	<0.05	38 (23.8%)	11 (6.9%)	160
Valid %	82.9	17.1						
Original Gun images	75 (62.5%)	11 (9.2%)	7.617	1	<0.01	28 (23.3%)	6 (5%)	120
Valid %	87.2	12.8						
Guns IRL	57 (70.4%)	4 (4.9%)	11.741	1	<0.001	19 (23.5)	1 (1.2%)	81
Valid %	93.4	6.6						

below. Additionally, specific behavior of covering or obscuring one's face was also tabulated.

**Actual possession.** We also recognized the importance of identifying images that suggest the tweet author or a close acquaintance presently owns or has immediate access to a gun. As compared to images that do not reflect this circumstance, actual possession images are of greater importance to individuals who are actively attempting to prevent gun violence and likely influence the perceived threat of an image. Images that met these criteria but were clearly historical photos did not qualify for this code.

#### Thematic content

#### Aggression

The aggression thematic code encompasses expressions of insults, taunts, threats, or other communications that suggest possible aggression toward another person or group.

#### Loss

This code includes communication that references feelings of grief, sadness, or sorrow in relation to the loss of a loved one due to death or incarceration. Loss also includes communications related to the ongoing remembrance or memorialization of a deceased friend or loved one.

#### Substance use

The substance use thematic code includes the presence of a substance other than cigarettes in an image coupled with some indication of current or future use.

#### Other

Communications related to any matter not otherwise covered by the previous themes—sports, music, food, relationships, daily life—were categorized as “other.”

#### Results

**Frequency and prevalence of gun images.** Of the 3528 available tweets with images contained in the primary dataset, 392 (11.1%) depicted a firearm in any context. Of these, 184 (47.0%) were original content gun images and 208 (53%) were retweeted images. In comparison to the overall sample, images containing guns were more likely to be original content than retweets ( $\chi^2 [1, N = 392] = 20.36, p < 0.001$ ). These images were posted by 119 (43.4%) of the 274 unique Twitter handles from the primary dataset. The average number of gun images per unique user was 3.29 (SD = 3.54). Of the available 1410 images in the secondary dataset, 169 (12.0%) depicted a gun in any context. These images were posted by 86 of the 173 (49.7%) unique Twitter handles. The average number of unique posts per Twitter handle was 1.97 (SD = 1.43). Across the entire sample, 40.5% of gun images depicted a gun in actual possession. In 36.4% of images, there was strong evidence that the gun depicted was not in actual possession. In 18.2% of cases, a gun in actual possession was plausible, but insufficient information precluded a definitive determination. In 4.8% of cases, missing data precluded a determination.

**Perceived gender.** Gender differences within the sample are presented in Table 2.

Across the available users in both samples, male accounts ( $n = 155$ ) were more common than female accounts ( $n = 54$ ) [ $\chi^2 (1, N = 209) = 48.81, p < 0.001$ ]. We conducted chi square tests to determine whether gender differences differed from the expected values given the gender proportions of the total dataset. The findings for users who posted at least one gun image in any context, users who posted an original content gun image, and users who posted an image depicting actual possession are reported in Table 2. The number of men exceeded the hypothesized value across all gun image posting groups, and men were increasingly over represented as the subjective gravity of the type of image posted increased.

**Gun attributes.** On average, each image in our Twitter corpus depicted 1.65 (SD = 1.39) firearms. Semi automatic handguns were the most common type of firearm representing 91.7% of all guns depicted. Revolvers and rifles represented 3.8% and 3.6%, respectively. For 3.0% of the images, the image had insufficient detail (e.g. picture was fuzzy or unclear) to determine the type of gun. Of semi automatic handgun magazines, standard capacity magazines were used in 62.7% of the guns depicted, extended magazines in 34.6%, and drum style magazines in 2.8%.

**Gun image-posting behavior.** Several behaviors associated with the position of the firearm were identified across the images. The most common behavior depicted pointing the gun at the camera, which accounted for 29.7% of the guns depicted. The second most frequent behavior (20.2%) was holding the gun in a ready position, or in a manner that reflected relaxed stance. This behavior almost always depicted the individual holding the firearm with his or her finger off the trigger and not pointed in the direction of another person—two common rules of firearm safety.

In contrast, 17.9% of guns were held in an atypical fashion, and the gun was not held in a ready position. For example, in some images the firearm was held upside down by the end of the magazine; in others, guns were not held at all by the user (16.4%), such as when a gun was depicted lying on a table. In 7.1% of images, guns were depicted on one's person. Most often, guns were kept in a waistband or carried around the neck on a lanyard. No holsters were depicted in the images. On occasion, guns were depicted as being pointed or placed in a way that had symbolic meaning. For example, one hand might hold a gun against one's temple while the other hand covers the mouth—a symbolic communication apparently referencing speaking with police or “snitching.”

**Visibility of faces.** The vast majority (74.5%) of images included the subject's face in full view. In 9.8% of images, at least one face in the image was obscured. In many images, plumes of smoke or low lighting reduced the level of detail of an individual's face to

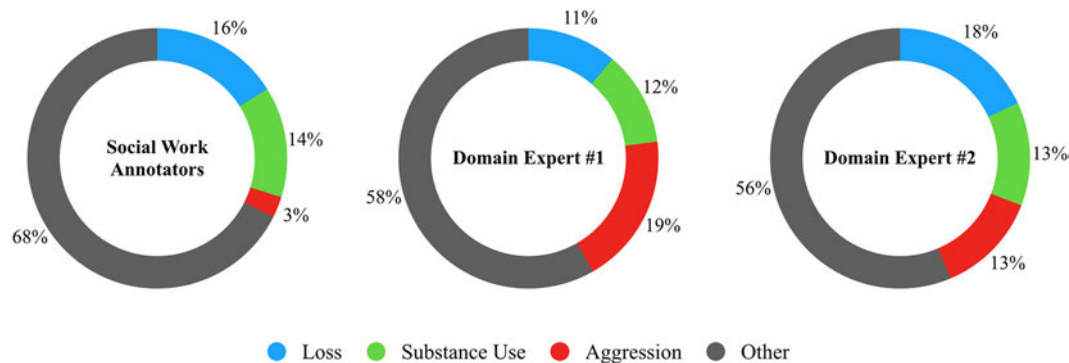


Fig. 1 Thematic code breakdown for all secondary image tweets

Table 3 The impact of gun image presence on aggression labeling				
	Odds ratio	95% CI	Z	p
Domain Expert #1	20.7090	13.5869–31.5644	14.094	<0.0001
Domain Expert #2	17.8550	12.1009–26.3454	14.522	<0.0001
S.W. Annotators	16.2478	8.7106–30.3070	8.765	<0.0001

the point that face identification was unlikely. In another 12% of images, faces were not featured in the image, for example when a firearm is pictured at someone’s feet or lying on a table. Though these do not demonstrate a direct attempt to obscure identity, they may or may not represent the subject’s effort to avoid having his or her face in an image. Subjects in just 3.6% of images made a clear attempt to obscure their identity. This was most often done using a mask, though in some instances, faces were blocked by an overlaid emoji.

**Thematic content.** Social work annotators and domain experts from Chicago categorized the entire secondary dataset. In Fig. 1 we present the thematic code proportions across social work and domain expert annotators for all 1687 image tweets from our dataset. In general, community domain experts categorized image tweets as *aggressive* at a rate of five to seven times that of lab annotators. Odds ratios were calculated to determine how the presence of a gun affected the likelihood of categorizing a tweet as aggressive (Table 3).

Across both domain experts and social work annotators, the presence of a gun greatly increased the likelihood that an image tweet would be coded as aggressive. Two general trends emerged while comparing these data. First, though social work annotators were less likely to see aggression in general, this effect was more pronounced when a gun was not present in an image. In this situation, just 1.3% of images were considered aggressive by annotators, compared to 8.4% and 13.7% of images considered aggressive by domain experts. Second, when a gun was present, annotators made lower estimates of aggression, but they were closer to the thematic coding levels of domain experts.

**Discrepancies in non-gun aggression labeling.** Interestingly, social work annotators saw less aggression than domain experts did when there was no gun present in the image the inverse of the previous theme. When a gun is not present in an image, annotators rely on less obvious cues of aggression. Through follow up interviews with domain experts, we discovered several indicators of aggression that had not been understood or captured by social work annotators. These included the reputation of the person in the image, specific aspects of local gang hand signs,

and subtle language based signals. Alternatively, differences in interpretation between domain expert and social work annotators may be explained by the different processes they used to code the Twitter data. Social work annotators used a seven step analysis process designed to support reviewers in fully grasping the meaning of a tweet. This process is slow, requiring social work annotators up to 2 weeks to analyze 100 tweets. In contrast, domain experts completed the coding task in isolation and without using the CASM process. As such, they coded the image tweets quickly (100 tweets coded in this manner in 1 2 h). At times, this may have produced a more surface level analysis of the tweets. From a cognitive perspective, coders may have activated more automatic schemas that led to an over reliance on aggressive cues.

Discussion

Given the prevalence of gang associated gun violence and the role of social media in understanding conflict and preventing in person confrontation, analysis of our findings yielded insight into two related areas of inquiry: factors contributing to gun image posting behavior and the complexity associated with accurate interpretation of gun image communication and its potential impact.

**Factors contributing to gun image-posting behavior.** In reviewing their gun image posting behavior, we find that although images of a gun, or sometimes multiple guns, appeared frequently in their Twitter images, their posting behavior how they held the guns, and the visibility of their faces paints a more complex story. The layers of posting behavior, together with the nuanced cultural, racial, ecological, and developmental factors that shape social media engagement among Black youth (Patton et al., 2013) make it difficult to interpret the images and determine the intent of the gun.

The frequency of gun images in any context in this group is about 11%. In other words, ~1 in 10 images posted by the sampled population contained an image of a gun. Factors contributing to frequent gun image posting behavior among the sampled population can be usefully approached via a symbolic interactionism framework. Blumer (1986) posits that “human interaction is mediated by the use of symbols and by interpretation, or by ascertaining of one another’s actions” (p. 180). Wilkinson and Fagan (1996) argue that the presence of guns, in an offline context, influences how decisions are made in both the social interactions that lead to disputes and in ongoing disputes. Interpretation of gun image posting and reaction to guns is couched in a broader social context: Offline, firearm injuries are concentrated in urban communities of color that also experience extreme levels of resource deprivation (Wilkinson and Fagan, 1996).

In a social media environment, gun image posting may be influenced by street codes and an ecology of danger. Anderson (2000) notes that street orientations govern the normative systems regarding human behavior in public space. Lane (2018) advanced this theory by suggesting that street codes are filtered through digital technology. More specifically, neighborhood risks and opportunities associated with urban poverty are mediated through the use of popular social networking tools like Twitter. Thus, images that depict an individual holding a firearm with his or her finger off the trigger and not pointed in the direction of another person, or images in which the subject displays his or her face while holding a gun, may be associated with digital street scripts. These behaviors aim to achieve and further social identity, convincing others to believe that identity, rather than conveying actual intent to use the firearm in the image.

Wilkinson and Fagan (1996) suggest that the importance of stature and reputation, as conveyed through posting a gun image on Twitter, may influence how an individual is perceived online and potentially confronted offline. Analysis of our datasets found that posted gun images depicted a variety of behaviors, but that it was quite common for guns to be held and pointed at the camera, in a “ready” position, or held in an atypical manner. Less commonly, guns were not held or were held in a symbolic way. A small subset of guns were depicted as stored on one’s person. Most commonly guns stored on a person were tucked into a waistband. In general, gun holding behaviors seemed to reflect a desire to display the gun, as opposed to the incidental capturing of daily firearm carrying behaviors. In addition, the vast majority of gun images are of semi automatic weapons, though some revolvers and rifles were observed.

Following this analysis, one might conclude that this specific type of gun posting behavior aims for impression management. Among the sampled population, posting of gun images appears to focus on the visibility of the gun as a digital street script. These scripts may articulate one’s bravado, toughness, or protection strategy.

**The complexity of accurately interpreting gun images.** In this study, domain experts lived in the same and similar communities as the Twitter users sampled. Research suggests that young people use social media to navigate their violent neighborhoods (Patton et al., 2013). Because young people use social media to navigate their neighborhoods, it may serve them if others interpret aggression from their online communications. The reality is, while a false positive (e.g. identifying text as aggression) may result in increased caution for no reason, a false negative (e.g. not identifying text as aggression) could lead to death. In addition, domain experts have a deep, nuanced knowledge of the culture, people, and places required to understand a social media post in context (Frey et al., 2018). While domain experts regarded most gun images as aggressive, a significant portion (~23% for one domain expert and 40% for the other) of image tweets were not considered aggressive.

Interestingly, expressions of loss were the next most common theme in gun images. The frequency of this co occurrence suggests an interesting link between aggression and loss and how they are perceived and communicated on social media (Patton et al., 2018b).

It is possible that images with guns are more likely to be labeled as aggressive because the gun is a salient symbol of aggression. An ecology of danger framing might suggest that social interactions perceived as threatening or lethal and the associated individuals are normatively seen as harboring hostile intent or the willingness to inflict harm (Wilkinson and Fagan, 1996). The well documented cognitive and behavioral effect of being exposed to

gun imagery, or “weapons effect,” suggests that when we see a gun or an image of a gun, we become primed to think and behave aggressively (Berkowitz and LePage, 1967). This effect may even be present when the gun is an image and not in a real life context.

## Conclusion

Sensitive and accurate interpretation of the meaning of gun images in tweets posted by Black Chicago youth is a complex undertaking. While gun images are frequent and pervasive, prior literature and a social systems approach warn against drawing punitive and potentially harmful conclusions without a humanistic and contextually informed understanding of the broad, diverse, and complicated reasons posting gun images on Twitter may serve Black Chicago youth. However, this study is not without limitations. It relies on the interpretations of gun images from violence outreach workers and master of social work students. While both groups have domain knowledge that is culturally nuanced, specific, and based on their lived experience, including the perspectives of individuals posting the images, individuals in the images, friends in their networks, and police officers who may interpret the images could enhance this work.

This study is an important first step in a critical assessment of how we interpret guns on social media and how we can leverage distinct populations’ interpretations to uncover potential bias and gaps in understanding the meaning of gun images on social media particularly those images posted by members of marginalized Black communities. When not used carefully, careless interpretations of gun images on social media can be, and have been, used as evidence to target individuals for arrest, as seen in New York City’s Operation Crew Cut efforts (Lane, 2018). At the same time, posting images of guns online may influence online and offline conflict. Future research should further investigate the role of gun imagery and social media as a means of identifying conflicts and preventing violence.

## Data availability

The dataset generated and/or analyzed during the current study is not publicly available due to the sensitive nature of the content, but are available from the corresponding author on reasonable request and signing of a MOU to ensure the ethical use of data.

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## Competing interests

The authors declare no competing interests.

## Additional information

Correspondence and requests for materials should be addressed to D.U.P.

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# EXHIBIT 98



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REPORT [The Constitution](#)

# The Current Gun Debate: Mass Shootings

March 12, 2018 6 min read



The Heritage Foundation

— SUMMARY

*The tragic school shooting in Parkland, Florida, has brought renewed attention to the issue of mass shootings. It is important to know the facts: Mass shootings in the U.S. are rare, and gun control measures are not likely to prevent them. Bombings, stabbings, and car attacks have been responsible for some of the deadliest mass killings, both in the U.S. and abroad. Creating new laws that violate Americans' constitutional rights will not solve the problem of mass killings.*

**KEY TAKEAWAYS**

- 1 Mass killings are rare, and mass public shootings are even rarer.**
- 2 Mass killers often find ways to kill even without firearms.**
- 3 Australia did not “eliminate mass public shootings” by banning assault weapons.**



In the wake of the tragic murder of 17 innocent students and teachers at Marjory Stoneman Douglas High School in Parkland, Florida, students, educators, politicians, and activists are searching for solutions to prevent future school shootings. As emotions morph from grief to anger to resolve, it is vitally important to supply facts so that policymakers and professionals can fashion solutions based on objective data rather than well-intended but misguided emotional fixes. Are there ways to reduce gun violence and school shootings? Yes, but only after objectively assessing the facts and working collaboratively to fashion common-sense solutions.

## Definitions

- “Mass shooting” typically refers to mass killings perpetrated by a firearm or firearms. In 2013, Congress defined “[mass killing](#)” as “3 or more killings in a single incident.”
- A prominent 2017 study defined “[mass public shootings](#)” as incidents that occur in the absence of other criminal activity (such as robberies, drug deals, and gang-related turf wars) in which a gun is used to kill four or more victims at a public location.

### 1. Mass killings are rare, and mass public shootings are even rarer.

- Mass killings [are very rare](#), accounting for only 0.2% of homicides every year and approximately 1% of homicide victims.
- Only 12% of mass killings are mass public shootings. Most mass killings are familicides (murders of family members or intimate partners) and felony-related killings (such as robberies gone awry or gang-related “turf battles”).
- Although there has been a slight increase in the frequency of mass public shootings over the past few years, the rates [are still similar](#) to what the United States experienced in the 1980s and early 1990s.

### 2. Many gun control measures are not likely to be helpful.

- [Over 90% of public mass shootings](#) take place in “gun-free zones” where civilians are not permitted to carry firearms.
- A complete ban on “assault weapons” will save very few lives: Six out of every 10 mass public shootings are carried out by [handguns alone](#), while only one in 10 is committed with a rifle alone.
- [The average age](#) of mass public shooters is 34, which means that increasing the minimum age for purchasing firearms would not target the main perpetrators of mass public shootings.
- Few mass public shooters have used “high-capacity magazines,” and there is [no evidence](#) that the lethality of their attacks would have been affected by delays of two to four seconds to switch magazines. In fact, some of the largest mass shootings in U.S. history were carried out with “low-capacity” weapons:
  - The Virginia Tech shooter killed 32 and injured 17 with two handguns, one of which had a 10-round magazine and the other a 15-round magazine. He simply brought 19 extra magazines.
  - 23 people were killed and another 20 injured in a Killeen, Texas, cafeteria by a man with two 9mm handguns, capable of maximums of 15-round and 17-round magazines, respectively.



- A mentally disturbed man armed with two handguns and a shotgun shot and killed 21 people in a San Ysidro McDonald's and injured another 19. The handguns utilized 13-round and 20-round magazines, and the shotgun had a five-round capacity.

3. Public mass shooters typically have histories of mental health issues.

- According to one study, [60% of mass public shooters](#) had been diagnosed with a mental disorder or had demonstrated signs of serious mental illness prior to the attack.
- A [large body of research](#) shows a statistical link between mass public killings and serious untreated psychiatric illness. The most [commonly diagnosed illnesses](#) among mass public shooters are paranoid schizophrenia and severe depression.
- It is important to remember that the [vast majority](#) of people with mental disorders do not engage in violent behaviors, and there is no empirical means of effectively identifying potential mass murderers.

4. The United States does not have an extraordinary problem with mass public shootings compared to other developed countries.

- After adjusting for population differences, many other developed countries have [worse problems with mass public shootings](#) than the United States has.<sup>[1]</sup>
- There were [27% more casualties](#) per capita from mass public shootings in the European Union than in the U.S. from 2009–2015.

5. Mass killers often find ways to kill even without firearms.

- Some of the worst mass killings in the United States have occurred without firearms:
  - Before the 2016 Orlando nightclub shooting, the deadliest attack on [the LGBT community](#) in America occurred in 1973 when an arsonist killed 32 and injured 15 at the Upstairs Lounge in New Orleans.
  - In 1987, a disgruntled former airline employee [killed 43 people](#) after he hijacked and intentionally crashed a passenger plane.
  - In 1990, an angry ex-lover burned down the [Happy Land social club](#) where his former girlfriend worked, killing 87 others in the process.
  - In 1995, 168 people were killed and more than 600 were injured by a truck bomb parked outside the [Alfred P. Murrah Federal Building](#) in Oklahoma City, Oklahoma.
  - In 2017, a man in New York City [killed eight and injured 11](#) by renting a truck and plowing down pedestrians on a Manhattan bike path.
- In other countries, bombings, mass stabbings, and car attacks frequently kill more people than even the deadliest mass shootings in the United States. Consider the following:

- [Spain](#) (2004) — Bombing: 192 deaths, 2,050 injuries;
- [Great Britain](#) (2005) — Bombing: 52 deaths, 784 injuries;
- [Japan](#) (2008) — Car ramming and stabbing: seven deaths, 10 injuries;
- [China](#) (2010) — Shovel-loader: 11 deaths, 30 injuries;
- [China](#) (2014) — Car ramming: six deaths, 13 injuries;
- [China](#) (2014) — Mass stabbing: 31 deaths, 143 injuries;
- [Germany](#) (2015) — Plane crash: 150 deaths;
- [Belgium](#) (2016) — Bombing: 21 deaths, 180 injuries;
- [France](#) (2016) — Car ramming: 86 deaths, 434 injuries;
- [Germany](#) (2016) — Car ramming: 11 deaths, 56 injuries;
- [Japan](#) (2016) — Mass stabbing: 19 deaths, 45 injuries; and
- [Great Britain](#) (2017) — Bombing: 22 deaths, 250 injuries.

6. Australia did not “eliminate mass public shootings” by banning assault weapons.

- Australia did not “[eliminate mass public shootings](#)” by banning assault weapons. Mass shootings in the country were rare before the 1996 National Firearms Act, and multiple-casualty shootings still occur.
- Before 1996, firearms crimes in Australia rarely involved firearms prohibited under the National Firearms Act, suggesting that any change in firearm-related crimes or deaths was not due to the law.
- Further, Australia did not see a reduction in “[mass murders](#).” In the years immediately following enactment of the National Firearms Act, the country experienced six mass murders in which five or more people were killed; they just were not killed with guns.

**Show References**



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*Authors*



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# EXHIBIT 99





## Rate and time to return to shooting following arthroscopic and open shoulder surgery

Joseph W. Galvin, DO<sup>a,\*</sup>, John Slevin, PA-C<sup>a</sup>, Henry H. Yu, MD<sup>a</sup>, Eric K. Turner, MD<sup>a</sup>, John M. Tokish, MD<sup>b</sup>, Jason A. Grassbaugh, MD<sup>a</sup>, Edward D. Arrington, MD<sup>c</sup>

<sup>a</sup>Department of Orthopedic Surgery, Madigan Army Medical Center, Tacoma, WA, USA

<sup>b</sup>Department of Orthopedic Surgery, Mayo Clinic-Arizona, Phoenix, AZ, USA

<sup>c</sup>Department of Orthopedic Surgery, University of Texas-Southwestern, Dallas, TX, USA

### ARTICLE INFO

#### Keywords:

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Shooting

Rifle

Return to shooting

Level of evidence: Level IV; Case Series;  
Prognosis Study

**Background:** There is limited information on return to shooting following shoulder surgery. The purpose of this study is to determine the rate and timing for resuming shooting a rifle following shoulder surgery.

**Methods:** We performed a retrospective review of prospectively collected data. The study included patients undergoing arthroscopic and open shoulder stabilization for unidirectional shoulder instability, and arthroscopic surgery for rotator cuff tears, SLAP lesions, biceps tendinopathy, and acromioclavicular pathology. Data collected included the laterality of surgery, shooting dominance, and patient reported outcome measures at the preoperative and postoperative visits. Starting at the 4.5 month clinic visit, patients were asked if they could shoot a military rifle.

**Results:** One hundred patients were identified with arthroscopic and open shoulder surgery with a mean age of 30 years (range, 18–45) and a mean follow up of 24 months (range, 12–32). The cohort consisted of patients undergoing arthroscopic Bankart repair (n = 23), arthroscopic posterior labral repair (n = 18), open Latarjet (n = 16), mini open subpectoral biceps tenodesis (OBT) (n = 25), OBT with open distal clavicle resection (DCR) (n = 10), open DCR (n = 4), and arthroscopic rotator cuff repair with concomitant OBT (n = 4). Significant improvement in SSV, VAS, ASES, and WOSI was shown at 1 year postoperative, SSV 85, VAS 2, ASES 85, WOSI 239,  $P = .001$ . The percentage of patients reporting the ability to shoot a military rifle postoperatively were 47%, 63%, 85%, and 94% at 4.5 months, 6 months, 1 year, and 2 years, respectively. At 4.5 months postoperatively, patients who underwent surgery ipsilateral to their shooting dominance (n = 59) had a rate of return to shooting (33%) versus shoulder surgery on the contralateral side of shooting dominance (n = 41) (60%),  $P = .04$ . However, there was no significant difference in the groups at 6 months and 1 year. Additionally, there was a significant difference in the rate of return to shooting at 6 months in patients undergoing arthroscopic posterior labral repair versus the remainder of the cohort (posterior instability (33%) vs. (69%),  $P = .016$ ), and a significant difference between posterior shoulder stabilization and anterior shoulder stabilization (70%),  $P = .03$ .

**Conclusion:** Patients undergoing arthroscopic and open shoulder surgery have a high rate of return to shooting. Approximately 60% of patients resume shooting at 6 months postoperatively and 85% return at 1 year. Patients undergoing shoulder surgery on the contralateral side of their shooting dominance return to shooting significantly faster than those with shoulder surgery ipsilateral to their shooting dominance. Additionally, those undergoing arthroscopic posterior shoulder stabilization return to shooting at a slower rate than anterior stabilization surgery.

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Madigan Army Medical Center Institutional Review Board approved this study, IRB Protocol #221092.

\*Corresponding author: Joseph W. Galvin, DO, FAAOS, Department of Orthopedic Surgery, 9040 Jackson Ave, Tacoma, WA 98431, USA.

E-mail address: [joseph.w.galvin@gmail.com](mailto:joseph.w.galvin@gmail.com) (J.W. Galvin).

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Shooting a rifle is a required task for many military athletes and law enforcement, and can be a leisure or competitive activity for civilian patients. Rifle shooting imparts a sudden anterior to posterior directed force against the anterior shoulder. This can lead to rare cases of symptomatic posterior shoulder instability.<sup>5</sup>

Additionally, the recoil of the rifle and the need to suspend and support the weapon with both upper extremities to successfully hit a target requires unique demands on both the affected and unaffected shoulder.<sup>11</sup> Rifle stability is achieved through compression of the buttstock against the shoulder while supporting the stock of the rifle with the contralateral arm through isometric elbow flexor contraction and shoulder forward elevation. Therefore, the dynamic task of rifle shooting involves a coordinated effort of the operative and nonoperative shoulder following shoulder surgery.

There is limited information on successful return to shooting following shoulder surgery. In fact, no prior studies have examined the rate or time to return to rifle shooting following shoulder surgery. This information would be valuable for military and law enforcement employers and patients, and also for patients seeking to understand the time to return to recreational and leisure shooting.

The purpose of this study is to determine the rate and timing for resuming shooting a rifle following arthroscopic and open shoulder surgery. We hypothesized that there would be a high rate of return to shooting a rifle following arthroscopic and open shoulder surgery.

## Methods

After institutional review board approval, we performed a retrospective review of prospectively collected data from a single institution. The study included all active duty military patients, age 18 to 45 years old, undergoing arthroscopic and open shoulder stabilization for symptomatic unidirectional shoulder instability, as well as patients undergoing arthroscopic surgery for rotator cuff tears, superior labrum anterior to posterior (SLAP) lesions, biceps tendinopathy, and acromioclavicular (AC) pathology. One hundred twenty four patients were identified. Patients were excluded if they had less than 1 year follow up. Therefore, 100 patients were available with the return to shooting data, clinical outcome scores, and at least 1 year clinical follow up.

*Shoulder arthroscopy, biceps tenodesis with or without distal clavicle resection, and rotator cuff repair: indications, operative technique, and rehabilitation*

Patients were indicated for shoulder arthroscopy, open subpectoral biceps tenodesis, with or without distal clavicle resection if they had history, physical examination, and advanced imaging findings consistent with a symptomatic SLAP tear, rotator interval pulley lesion, or biceps tenosynovitis. Patients with both anterior Zone 2 biceps groove tenderness to palpation and a positive Speed's examination that replicated their anterior shoulder pain underwent a preoperative ultrasound guided biceps groove diagnostic injection of a combined mixture of local anesthetic and steroid. For these biceps tenosynovitis patients, they were indicated for surgery if they sustained 75%–100% pain relief from the injection. Furthermore, for patients with symptomatic AC joint pathology, patients were indicated for surgery following significant improvement in a fluoroscopic guided AC joint diagnostic and therapeutic injection. Young active duty patients with rotator cuff tears were indicated for surgery after failure of at least 6 weeks of nonoperative treatment with dedicated physical therapy, and had history, physical examination, and imaging findings concordant with a symptomatic rotator cuff tear.

All biceps tenodesis, AC joint and rotator cuff repair procedures were performed in the beach chair position first with a diagnostic shoulder arthroscopy and biceps tenotomy, followed by an open subpectoral biceps tenodesis with a unicortical biocomposite double loaded suture anchor as previously described.<sup>13</sup> All distal

clavicle resections were done through an open superior approach with 8 mm of distal clavicle resection. Rotator cuff repairs were performed arthroscopically with suture anchors. Postoperatively, all biceps tenodesis patients underwent a standard institutional rehabilitation protocol with passive range of motion starting at 2 weeks, active range of motion at 6 weeks, and strengthening starting at 8 weeks. Heavy lifting or resisted supination was prohibited until 8 weeks postoperative. For patients who underwent arthroscopic rotator cuff repair, rehabilitation was generally 4 to 6 weeks in a shoulder immobilizer in abduction (this was based on the intraoperative size and morphology of the tear). Then passive range of motion began at 4 to 6 weeks, active range of motion at 8 weeks, and rotator cuff strengthening at 12 weeks.

*Arthroscopic shoulder stabilization: indications, operative technique, and rehabilitation*

For unidirectional anterior and posterior shoulder instability cases, patients were indicated for arthroscopic anterior and posterior shoulder stabilization if they had history, physical examination, and imaging findings consistent with recurrent unidirectional anterior or posterior shoulder instability. Additionally, indications for arthroscopic Bankart repair were patients with no prior surgery with less than 13.5% anterior inferior glenoid bone loss and on track Hill–Sachs lesions. All arthroscopic stabilization procedures were performed in the lateral decubitus position with a minimum of 3 knotless suture anchors. A mean of 4.3 knotless suture anchors were utilized for arthroscopic Bankart repair and a mean of 3.9 knotless suture anchors for arthroscopic posterior labral repair (Fig. 1). Postoperative rehabilitation consisted of shoulder immobilizer wear for 6 weeks with no active use of the arm and early initiation of passive range of motion. The therapy regimen for arthroscopic posterior stabilization differed from arthroscopic Bankart repair in that it emphasized protecting the posterior capsule with restrictions in internal rotation until 3 months postoperatively, whereas arthroscopic Bankart repair patients had no restrictions in internal rotation at 6 weeks.

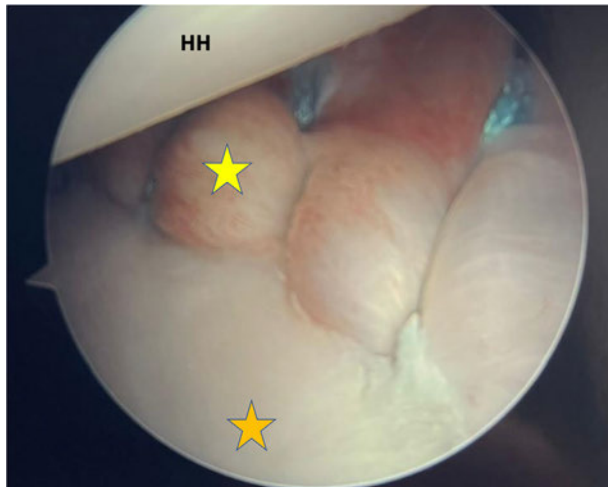
*Open shoulder stabilization: indications, operative technique, and rehabilitation*

Patients were indicated for the open Latarjet procedure if they had “critical” (greater than 20 percent) glenoid bone loss, greater than 13.5% glenoid bone loss with an offtrack Hill–Sachs lesion, and had history of a failed arthroscopic Bankart repair with bipolar bone loss. All Latarjet procedures were performed in the beach chair position through an open approach, subscapularis split, and two solid fully threaded 3.5 mm bicortical screws. Postoperatively, Latarjet patients started pendulum exercises immediately, passive range of motion at 2 weeks postoperatively, active range of motion at 4 weeks, and strengthening at 8 weeks. All arthroscopic and open shoulder surgery patients were allowed to return to shooting a rifle at 4.5 months per the standard institutional rehabilitation protocol.

## Data collected

Demographic data were collected for all patients, including the laterality of surgery, patient hand dominance, and shooting dominance (Table 1). Shooting dominance was defined as the side the patient places the rifle on while firing. For example, a left shooting dominant patient placed the buttstock in the left anterior shoulder and pulled the trigger with the left index finger. Patient reported outcomes collected included the Subjective Shoulder Value (SSV), American Shoulder and Elbow Surgeons (ASES) score, visual analog scale (VAS) score for pain, and the Western Ontario Shoulder





**Figure 1** Arthroscopic photo status post right arthroscopic posterior capsulolabral repair with 4 knotless suture anchors. Patient is positioned in the lateral decubitus position. (★ posterior labrum, ★ glenoid, HH humeral head).

Instability (WOSI) index at the preoperative visit and short term postoperative visits. At the 4.5 month, 6 month, 1 year, and 2 year clinic visits, patients were asked if they could shoot a military rifle and patient reported outcome measures were collected. The current military rifle in use is the M4 carbine which is a 5.56 mm, gas operated, magazine fed, carbine assault rifle (Fig. 2). The civilian equivalent rifle is the AR 15. Although officers in the military (as opposed to enlisted soldiers) are typically assigned a pistol for shooting, the 2 officers in our cohort were “dual carry,” and had to qualify also on an M4 rifle.

#### Statistical analysis

Descriptive statistics were determined for the study cohort's variables. Univariate analysis was performed for all variables. The Mann Whitney nonparametric test for unpaired samples was used for continuous variables, and the 2 tailed Fisher exact test was used for categorical data. Multivariate logistic regression was utilized to determine independent variables significantly associated with the ability to return to shooting at 6 months postoperatively. The statistical significance was set to a *P* value of .05. All statistics were performed using online software (<https://www.easymedstat.com>).

#### Results

One hundred patients were included in the final analysis. The mean age was 30.8, range (18–45), with a predominantly male cohort. Ninety percent of the cohort was right hand dominant, and 84% reported right side shooting dominance, with 16% left shooting dominant (Table I). Median baseline preoperative patient reported outcomes were as follows: SSV 50, VAS 7, ASES 42, and WOSI 1419. Significant improvement in SSV, VAS, ASES, and WOSI was shown at 1 year postoperative, SSV 85, VAS 2, ASES 85, WOSI 239, *P* .001 (Table II). The percentage of patients reporting the ability to shoot a military rifle after surgery was the following: 47%, 63%, 85%, and 94% at 4.5 months, 6 months, 1 year, and 2 years, respectively. At 4.5 months postoperatively, patients who underwent shoulder surgery ipsilateral to their shooting dominance (*n* = 59) had a rate of return to shooting (33%) vs. shoulder surgery on the contralateral side of shooting dominance (*n* = 41) (60%), *P* .04.

**Table I**  
Demographics.

	Shoulder surgery ipsilateral to shooting dominance (N = 59)	Shoulder surgery contralateral to shooting dominance (N = 41)	<i>P</i> value
Mean age, years (SD)	30 (7.9)	31 (8.4)	.33
Sex (male:female)	58:1	39:2	.61
Laterality of surgery (R:L)	48:11	5:36	<b>.001</b>
Hand dominance (R:L)	53:6	37:4	.99
Shooting dominance (R:L)	48:11	36:5	.41
Diagnosis (%)			
Anterior shoulder instability	23 (39)	16 (39)	.81
Posterior shoulder instability	10 (17)	8 (20)	
SLAP tear	9 (15)	3 (7)	
Biceps tendinopathy	14 (24)	10 (24.5)	
AC joint arthritis	2 (3)	3 (7)	
Rotator cuff tear	1 (2)	1 (2.5)	
Surgery performed (%)			
Arthroscopic Bankart repair	12 (20)	11 (27)	.46
Arthroscopic posterior labral repair	10 (17)	8 (20)	
Open Latarjet	11 (19)	5 (12)	
Biceps tenodesis	16 (27)	9 (22)	
Biceps tenodesis + DCR	6 (10)	4 (9.5)	
Open DCR	1 (2)	3 (7)	
Arthroscopic RCR + BT	3 (5)	1 (2.5)	
Open: arthroscopic	38:21	23:18	.65
Posterior instability diagnosis (Yes:No)	10:49	8:33	.99
Mean follow-up (mo), (range)	24 (12–32)	24 (12–33)	.99

SD, standard deviation; R, right; L, left; SLAP, superior labrum anterior to posterior; AC, acromioclavicular; DCR, distal clavicle resection; BT, biceps tenodesis; RCR, rotator cuff repair.

Bold indicates statistical significance value (*P* < .05).

However, there was no significant difference in the groups at 6 months and 1 year (Fig. 3).

#### Subgroup analyses

In subgroup analyses, there was no difference in rate and time to return to shooting in patients who underwent arthroscopic (*n* = 39) vs. open shoulder surgery (*n* = 61). Furthermore, there was no significant difference in the rate and time to resuming shooting a rifle at any time point between patients undergoing surgery for a diagnosis of shoulder instability (*n* = 57) vs. non instability diagnoses (*n* = 43) (Table III).

#### Arthroscopic posterior shoulder stabilization: subgroup analysis

However, when we analyzed patients who underwent arthroscopic posterior shoulder stabilization (*n* = 18) vs. the remainder of the cohort (*n* = 82), there was a statistically significant difference in the rate and time to return to shooting at 6 months postoperatively, posterior instability (33%) vs. (69%), *P* .016. At 1 year postoperatively, there was no significant difference between the groups (87%) vs. (84%), *P* .99. At 6 months postoperatively, patients who underwent arthroscopic posterior labral repair ipsilateral to their shooting dominance (*n* = 10) had a rate of return to shooting (22%) vs. posterior labral repair on the contralateral side of shooting dominance (*n* = 8) (57%), *P* .30. In addition, there was a statistically significant difference in the rate and time to return to shooting at 6 months postoperatively between patients undergoing shoulder surgery for posterior instability (33%) versus anterior instability (70%), *P* .03.

In multivariate logistic regression analysis, a diagnosis of posterior shoulder instability was independently significantly associated with the inability to return to shooting a rifle at 6 months postoperatively, *P* .01.





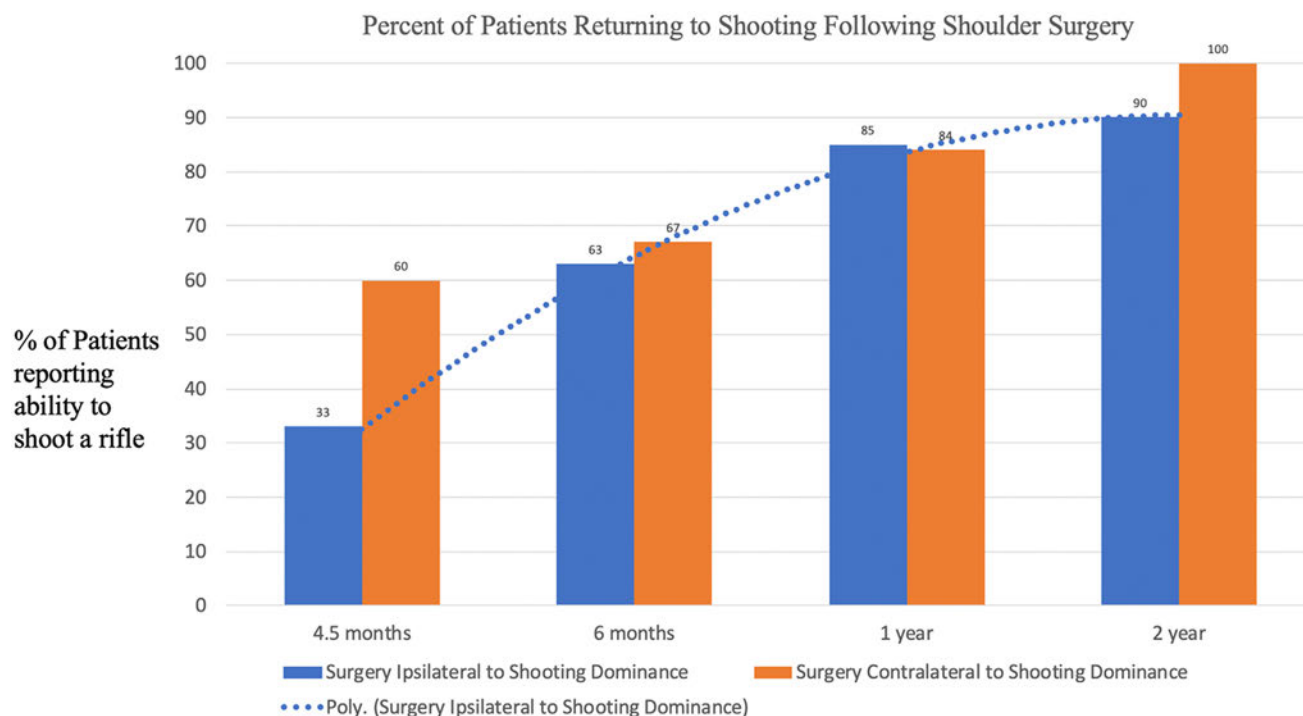
**Figure 2** Picture of a right shooting dominant active duty soldier firing the M4 rifle. The buttstock is held against the right anterior shoulder. The left arm supports the forestock of the rifle.

**Table II**

Clinical outcomes.

	Preop	6 weeks postop	3 mo postop	4.5 mo postop	6 mo postop	1 y postop	2 y postop
Median SSV	50	60	70	75	80	85	80
Median VAS	7	3	2	3	2	2	2
Median ASES	42	53	72	73	82	85	80
Median WOSI	1419	1213	724	678	305	239	350

SSV, Subjective Shoulder Value; VAS, visual analog scale score for pain; ASES, American Shoulder Elbow Surgeons score; WOSI, Western Ontario Shoulder Instability Index.



**Figure 3** This bar graph depicts the speed of recovery and rate and time to resuming shooting a rifle following arthroscopic and open shoulder surgery. Patients who underwent shoulder surgery ipsilateral to their shooting dominance are represented by the blue bars, and those that underwent shoulder surgery contralateral to their shooting dominance by the orange bars.

**Table III**  
Return to shooting: instability surgery versus non-instability surgery.

	Instability surgery (N = 57)	Non-instability surgery (N = 43)	P value
Mean age, y (SD)	26 (5)	36 (7)	<b>.001</b>
Sex (male:female)	56:1	41:2	.59
Hand dominance (R:L)	53:4	37:6	.50
Shooting dominance (R:L)	52:5	32:11	.06
4.5 mo able to shoot rifle (%)	49	44	.92
6 mo able to shoot rifle (%)	56	70	.29
1 y able to shoot rifle (%)	92	77	.08
2 y able to shoot rifle (%)	92	95	.29

SD, standard deviation; R, right; L, left.

Bold indicates statistical significance value ( $P < .05$ )

### Complications/reoperations

There were 4 complications (4/95) 4.2%. Four patients who underwent open Latarjet had transient sensory neuropraxias (3 axillary and 1 musculocutaneous) which all completely resolved by 4 weeks postoperatively. Two of the axillary nerve sensory neuropraxias were identified in the postoperative recovery room and resolved by the 2 week postoperative visit. This was a 4/16 (25%) rate of transient sensory neuropraxia. There were no permanent nerve injuries. Three of the 4 Latarjet procedures with temporary sensory neuropraxias returned to shooting at 4.5 months, and the other patient reported returning at 6 months postoperatively. Two patients who underwent arthroscopic Bankart repair reported reinjuries with recurrent traumatic subluxation events (2/23) (8.7%), and declined to undergo further surgery. The first of these patients reported not being able to return to shooting at 6 months postoperatively, and the second patient reported the ability to return to shooting at 4.5 months postoperatively and then sustained the reinjury 1 year after surgery. One patient who underwent open Latarjet for greater than 20% glenoid bone loss had coracoid graft lysis without recurrent instability. He later sustained a traumatic rotator cuff tear after a motor vehicle collision and underwent an arthroscopic rotator cuff repair.

### Discussion

The primary findings of this study are that there is a high rate of return to shooting a rifle following arthroscopic and open shoulder surgery in young patients. Based on our cohort of 100 patients, 63% reported the ability to shoot their rifle at 6 months and 85% at 1 year postoperatively. Patients who underwent shoulder surgery ipsilateral to their shooting dominance returned to shooting significantly slower than those with surgery contralateral to their shooting dominance. However, there was no significant difference in the groups at 6 months and 1 year. Interestingly, when we analyzed the group of patients who underwent arthroscopic posterior shoulder stabilization versus the remainder of the cohort, there was a significant difference in the rate and time to return to shooting at 6 months postoperatively, with posterior instability patients having a lower rate, posterior instability (33%) vs. (69%). At 1 year postoperatively, there was no significant difference between the groups. Additionally, at 6 months postoperatively, patients who underwent arthroscopic posterior labral repair ipsilateral to their shooting dominance had a rate of return to shooting (22%) vs. posterior labral repair on the contralateral side of shooting dominance (57%). Therefore, this study identified two important findings. First, patients undergoing surgery ipsilateral to their shooting dominance return at a slower rate. Second, patients undergoing

arthroscopic posterior shoulder stabilization return to shooting at a slower rate.

There is limited evidence on return to shooting a rifle following arthroscopic or open shoulder surgery. However, there are a number of studies reporting on return to sport (RTS) and return to duty (RTD). Prior studies have reported that the return to sport and return to duty following biceps tenodesis and treatment of shoulder instability is approximately 4 to 5 months.<sup>1-3,6,7,10,12,14</sup> Provencher et al reported on 101 patients who underwent open subpectoral biceps tenodesis and found that 82% of patients returned to duty at a mean of 4.1 months.<sup>12</sup> Cassidy et al performed a systematic review and found that military patients returned to duty at 5.4 months following biceps tenodesis.<sup>3</sup> Abdul Rassoul et al and Hurley et al performed systematic reviews to determine the mean time to return to play following arthroscopic Bankart repair and open Latarjet, respectively.<sup>2,10</sup> The mean time to RTS was 5.9 months for arthroscopic Bankart repair and 5.8 months for open Latarjet. Cruz et al evaluated the rate and time to return to duty following open Latarjet in patients with glenoid bone loss, and found 89% were able to return to full unrestricted duty at a mean of 5.3 months.<sup>6</sup> The difficulty in using 'return to duty' as an outcome measure is that it is too broad, and RTD varies based on a number of variables including rank (junior vs. senior enlisted), military occupational specialty, the unit's training cycle, and other psychosocial factors. Additionally, many military studies utilize profiling data to retrospectively determine RTD. This data is limited in its fidelity secondary to a number of variables inherent to the military profiling system. In this study, we attempted to take a more granular approach by asking patients specifically if they could shoot their military rifle at each postoperative time point, and then we retrospectively reviewed this prospectively collected data. We included 4.5 months as a follow up time point as patients undergo a significant amount of progression in their activities, range of motion, and strength in between the typical 3 and 6 month follow up clinic visits.

Interestingly and as one might expect, patients who underwent surgery ipsilateral to their shooting dominance (ie, right shooting dominance with right shoulder surgery or left shooting dominance with left shoulder surgery) returned to shooting significantly slower than those with contralateral surgery to their shooting dominance. Furthermore, posterior shoulder stabilization patients returned to shooting at a significantly slower rate, especially if they had surgery ipsilateral to their shooting dominance. However, at 1 year postoperatively there was no significant difference between any of the groups. The reasons that arthroscopic posterior stabilization patients returned to shooting at a slower rate is unclear; however, based on our data we hypothesize that it is likely related to the following points. First, the anterior to posterior directed force of the rifle's recoil places stress on the repaired posterior capsulolabral repair and this leads to patients having apprehension about returning to shooting. Second, the rehabilitation protocol for arthroscopic posterior labral repair is slower than the protocol for anterior shoulder stabilization and for shoulder arthroscopy and OBT plus or minus DCR. Our rehabilitation protocol restricts internal rotation in posterior labral repair patients until 3 months postoperatively. This may account for the slower return to shooting.

Interestingly, in this cohort, we also prospectively collected the ability to return to shooting at 3 months postoperatively. We found that 37% of patients reported the ability to shoot their rifle at 3 months including one patient following open Latarjet for critical glenoid loss and a history of over 50 dislocation events and dislocating in his sleep (Fig. 4). Of the patients who reported the ability to shoot a rifle at 3 months postoperatively, none of them had a postoperative complication or were a clinical failure of surgery based on their postoperative clinical outcome scores. Although



**Figure 4** Anteroposterior (AP) and axillary lateral views of a young male patient who was an active duty infantryman status post open Latarjet procedure. At 3 months post-operatively, the patient reported the ability to shoot his military rifle.

**Table IV**

Recoil of commonly utilized shoulder-fired rifles.

Cartridge	Free recoil energy (ft-lbs)	Recoil velocity (ft/sec)	Average muzzle velocity (ft/sec)
.223 / 5.56	5.48	6.65	3122
.270 Winchester	17.64	11.64	2944
.308 Winchester	18.27	11.62	2491
.30-06 Springfield	21.34	12.55	2646
.338 Win Mag	29.90	13.75	2705
.378 Weatherby Mag	60.68	19.38	3040

Ft, foot; lbs, pounds; sec, second.

physical therapists and surgeons would not allow patients to go to a range to actually shoot a rifle that soon after surgery, these data are interesting and provides insight into the speed of recovery in select patients. Further investigation is needed.

Although this study helps delineate the return to shooting with the M4 rifle, which is equivalent to a .223 caliber rifle, it remains unclear how well this correlates to other shoulder fire weapons. In regards to rifle recoil, the M4 is relatively light in both force and velocity compared to many other shoulder fired weapons used for hunting and recreation. It has been shown that approximately 70% of the rifle's recoil is transmitted through the shoulder, with the remaining force distributed through the grip, cheek, and forestock.<sup>4</sup> The elements of recoil consist of both the force which it produces (measured in foot pounds) and the velocity (measured in feet per second). Therefore, recoil is a function of weapon weight, powder load, bullet weight, and cartridge design. When compared to many hunting rifles, the M4 often produces 3 to 4 times less recoil energy and typically about half of the recoil velocity (Table IV).<sup>8,9</sup> Although we could presume that larger recoil would translate to increased pain and potentially a slower return to shooting, this would require further studies to confirm this.

Furthermore, in addition to recoil, the other key variable required for successful return to shooting is the ability to generate adequate rifle stability. This has been studied in the biathlon shooting population.<sup>11</sup> Rifle stability is achieved through compression of the buttstock against the shoulder while supporting the stock of the rifle with the contralateral arm through isometric elbow flexor contraction and shoulder forward elevation. Therefore, the dynamic task of rifle shooting involves a coordinated effort of the operative and nonoperative shoulder following shoulder surgery.

Limitations of the study include its retrospective design. In addition, the study was limited by the inherent weaknesses in self reporting return to duty.<sup>15</sup> We acknowledge that asking patients whether they can shoot a rifle is distinctly different than the patient

actually shooting a rifle on a range. However, it would be challenging to objectively assess this task after shoulder surgery in all patients given that rifle ranges are conducted by units during certain training cycles and times during the year. Use of a simulator may be a future area of potential study to assess ability to return to shooting. Lastly, this cohort was composed of active duty military assigned the M4 carbine rifle and may not be generalizable to a civilian population firing other higher caliber rifles. However, we feel these data can be extrapolated to the civilian population as patients commonly recreationally or competitively shoot the AR 15 which is the equivalent rifle to the M4 carbine.

Strengths of the study include the detailed collection of both preoperative and postoperative legacy patient reported outcome measures at multiple time points to develop an accurate speed and trajectory of recovery. Additionally, the collection of the ability to return to shooting a rifle starting at multiple postoperative appointments provides valuable data on the speed of recovery.

## Conclusion

Patients undergoing arthroscopic and open shoulder surgery have a high rate of return to shooting. Approximately 60% of patients resume shooting at 6 months postoperatively and 85% return at 1 year. Patients undergoing shoulder surgery on the contralateral side of their shooting dominance return to shooting significantly faster than those with shoulder surgery ipsilateral to their shooting dominance. Additionally, those undergoing arthroscopic posterior shoulder stabilization return to shooting at a slower rate than anterior stabilization surgery.

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# EXHIBIT 100



# Mass Murder with Firearms: Incidents and Victims, 1999-2013

**William J. Krouse**

Specialist in Domestic Security and Crime Policy

**Daniel J. Richardson**

Research Assistant

July 30, 2015

**Congressional Research Service**

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[www.crs.gov](http://www.crs.gov)

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## Summary

In the wake of tragedy in Newtown CT, Congress defined “mass killings” as “3 or more killings in a single incident” (P.L. 112-265). Any consideration of new or existing gun laws that follows mass shootings is likely to generate requests for comprehensive data on the prevalence and deadliness of these incidents. Despite the pathos of mass shootings, only a handful of researchers and journalists have analyzed the principal source of homicide data in the United States—the Supplementary Homicide Reports (SHR) compiled by the Federal Bureau of Investigation (FBI)—to determine whether those incidents have become more prevalent and deadly.

According to the FBI, the term “mass murder” has been defined generally as a multiple homicide incident in which four or more victims are murdered, within one event, and in one or more locations in close geographical proximity. Based on this definition, for the purposes of this report, “mass shooting” is defined as a multiple homicide incident in which four or more victims are murdered with firearms, within one event, and in one or more locations in close proximity. Similarly, a “mass public shooting” is defined to mean a multiple homicide incident in which four or more victims are murdered with firearms, within one event, in at least one or more public locations, such as, a workplace, school, restaurant, house of worship, neighborhood, or other public setting.

This report analyzes mass shootings for a 15-year period (1999-2013). CRS analysis of the FBI SHR dataset and other research indicates that offenders committed at least 317 mass shootings, murdered 1,554 victims, and nonfatally wounded another 441 victims entirely with firearms during that 15-year period. The prevalence of mass shooting incidents and victim counts fluctuated sporadically from year to year. For the period 2007-2013, the annual averages for both incidents and victim counts were slightly higher than the years from 1999-2007.

With data provided by criminologist Grant Duwe, CRS also compiled a 44-year (1970-2013) dataset of firearms-related mass murders that could arguably be characterized as “mass public shootings.” These data show that there were on average:

- one (1.1) incident per year during the 1970s (5.5 victims murdered, 2.0 wounded per incident),
- nearly three (2.7) incidents per year during the 1980s (6.1 victims murdered, 5.3 wounded per incident),
- four (4.0) incidents per year during the 1990s (5.6 victims murdered, 5.5 wounded per incident),
- four (4.1) incidents per year during the 2000s (6.4 victims murdered, 4.0 wounded per incident), and
- four (4.5) incidents per year from 2010 through 2013 (7.4 victims murdered, 6.3 wounded per incident).

These decade-long averages suggest that the prevalence, if not the deadliness, of “mass public shootings” increased in the 1970s and 1980s, and continued to increase, but not as steeply, during the 1990s, 2000s, and first four years of the 2010s.

Mass shootings are arguably one of the worst manifestations of gun violence. As discussed in this report, statute, media outlets, gun control and rights advocates, law enforcement agencies, and

researchers often adopt different definitions of “mass killing,” “mass murder,” and “mass shooting,” contributing to a welter of claims and counter-claims about the prevalence and deadliness of mass shootings. With improved data, policymakers would arguably have additional vantage points from which to assess the legislative proposals that are inevitably made in the wake of these tragedies.

Toward these ends, Congress could consider directing one or several federal agencies, including but not limited to the FBI and BJS, to improve collection of data on multiple-victim homicides. Congress could also direct federal agencies, possibly the Bureau of Alcohol, Tobacco, Firearms and Explosives, to report annually on firearms-related mass murders, including data on (1) offender acquisition of firearms, (2) types of firearms used, (3) amounts and types of ammunition carried and shots fired, (4) killed and wounded counts, (5) offender histories of mental illness and domestic violence, and (6) victim-offender relationships.

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## Introduction

Mass murders committed with firearms—particularly those incidents that occur in workplaces, schools, restaurants, houses of worship, and other public spaces—cause people to feel anxious and vulnerable,<sup>1</sup> as the recent Charleston, SC,<sup>2</sup> and Chattanooga, TN,<sup>3</sup> tragedies demonstrate. Several such mass murders in 2012, seven incidents by most counts, compounded a fear among many people that “this could happen to me.”<sup>4</sup> This rash of shootings prompted media outlets, gun control advocacy groups, and law enforcement agencies to question whether such incidents were becoming more prevalent and deadly,<sup>5</sup> or had possibly reached “epidemic” proportions.<sup>6</sup> Toward those ends, some of these groups amassed compilations of multiple victim homicides, but their methodologies often differed substantially, and their focus and findings were sometimes quite different.<sup>7</sup> A handful of researchers who have studied mass murder have utilized official crime data to compile comprehensive datasets of multiple victim homicides and mass murders.<sup>8</sup> The

<sup>1</sup> According to one nationwide survey of adults, Americans’ top fears include (1) walking alone at night, (2) becoming the victim of identity theft, (3) various risks of using the Internet, (4) being the victim of a mass/random shooting, and (5) public speaking. See Jerry Lange, “When Fear Outweighs Reality,” *Seattle Times*, October 23, 2014.

<sup>2</sup> On June 17, 2015, a lone white offender entered the Emanuel African Methodist Episcopal Church in Charleston, SC, and murdered nine Black parishioners with a handgun, reportedly a .45 caliber semiautomatic pistol. He carried eight detachable magazines, with which he reloaded several times. The alleged offender is 21 years old. He has been indicted federally under hate crime statutes. Mark Berman, “Roof Indicted on Federal Hate-Crime Charges,” *Washington Post*, July 23, 2015, p. A3. Jeremy Borden, Sari Horwitz, and Jerry Markon, “Man Arrested in Charleston Killings: The Suspect, A Young Life That Had Quietly Drifted Off Track,” *Washington Post*, June 19, 2015, p. A1, A12.

<sup>3</sup> On July 16, 2015, a lone offender fired more than 50 shots into a U.S. Armed Forces recruiting center in Chattanooga, TN. He then drove to a U.S. Navy Operational Support Center and shot to death four Marines and fatally wounded a Sailor. He also nonfatally wounded another Marine and a police officer. The offender was 24-years old. He was armed with an AK-74. Police recovered a Saiga 12-gauge pistol grip shotgun from his rental car. He was reportedly shot to death by police, who were attempting stop and arrest him. Police recovered two other pistols that were privately owned and possibly carried by two of the Marines. It is possible that the Marines exchanged fire with the offender, but it is unclear whether they hit the offender and preliminary reports have ruled out any friendly fire casualties among the victims. According to the Federal Bureau of Investigation, the incident is being investigated as a case of “home-grown violent extremism.” Adam Goldman, “Gunman Worked Methodically, FBI Says of Attack,” *Washington Post*, July 23, 2015, p. A3. Thomas Gibbons Neff and Adam Goldman, “Marine Slain in Tenn. May Have Returned Fire,” *Washington Post*, July 21, 2015, p. A02.

<sup>4</sup> Grant Duwe quoted by Charles Lewis, “Mass Public Killing Under 1% of All Murders; More Media Coverage,” *National Post* (formerly known as *The Financial Post*) (Canada), July 21, 2012, p. A4.

<sup>5</sup> Mark Follman, Gavin Aronsen, and Deanna Pan, “A Guide to Mass Shootings in America,” *Mother Jones*, July 20, 2012, <http://www.motherjones.com/politics/2012/07/mass-shootings-map>. Hereinafter cited as “A Guide to Mass Shootings in America,” *Mother Jones*. It is noteworthy that Mayors Against Illegal Guns (MAIG; today, Everytown for Gun Safety) released a mass shootings dataset of its own, which included family mass murders/shootings that occurred in both public and private locations. Brad Plumer, “Study: The U.S. Has Had One Mass Shooting per Month Since 2009,” *Washington Post*, February 2, 2013.

<sup>6</sup> Mark Follman, “America Is Facing a Mass-Shooting Epidemic,” *The Chronicle* (Willimantic, CT), Oct. 27, 2014, p. 05. Also, see Megan McArdle, “Department of Awful Statistics: Are Mass Shootings Really on the Rise?,” *Daily Beast*, January 28, 2013, <http://www.thedailybeast.com/articles/2013/01/28/departments-of-awful-statistics-are-mass-shootings-really-on-the-rise.html>.

<sup>7</sup> Lin Huff-Corzine, James C. McCutcheon, Jay Corzine, John P. Jarvis, Melissa J. Tetzlaff-Bemiller, Mindy Weller, and Matt Landon, “Shooting for Accuracy: Comparing Data Sources on Mass Murder,” *Homicide Studies*, vol. 18(1), 2014, p. 106.

<sup>8</sup> *Ibid.*

analysis in this report builds upon the latter work and scholarship,<sup>9</sup> as well as the compilations described above.

### Key Takeaways of This Report

- For 15 years (1999-2013), the United States has seen about 31 mass murders per year on average that resulted in four or more persons being murdered in a single incident. Of those incidents, CRS has confirmed that 21 per year on average were committed entirely with firearms.
- Of those mass murders with firearms, 4.4 per year on average were mass public shootings that occurred in one or more public locations, such as a workplace, school, restaurant, house of worship, neighborhood, or other public setting.
- For the same 15 years, the United States has seen about 8.5 familicide mass shootings per year on average, in which offenders typically murdered their domestic partners and children in private residences or secluded, sparsely populated settings, and 8.3 other felony mass shootings per year on average, in which offenders committed murders as part of some other underlying criminal activity (robbery, insurance fraud, or criminal competition) or commonplace circumstance (argument).
- Since the 2012 Newtown, CT, tragedy, the national dialogue on gun violence has been focused on mass public shootings, partly due to several such shootings in recent years (2007, 2009, and 2012) that resulted in double-digit victim counts.
- Based on five-year annual averages, the United States saw an uptick in the prevalence and deadliness of mass public shootings for the last five years (2009-2013). However, those increases were largely driven by a few incidents in 2012. If 2012 were excluded, the averages would actually have been lower than the preceding five-year period (2004-2008).
- For 44 years (1970-2013), the prevalence of mass public shootings has increased: 1.1 incidents per year on average in the 1970s, 2.7 in the 1980s, 4.0 in the 1990s, 4.1 in the 2000s, and 4.5 in the first four years of the 2010s.
- Generalizations about offenders who commit mass public shootings are often carried over and applied to other offenders, who commit mass shootings under different circumstances. The three broad patterns of firearms-related mass murders identified in this report—public, familicide, and other felony—present different, but sometimes overlapping, sets of issues and challenges.

What is “mass murder” with firearms? According to the Federal Bureau of Investigation (FBI) criminal profilers, the term “mass murder” has been defined generally as a multiple homicide incident in which four or more victims are murdered—not including the offender(s)—within one event, and in one or more geographical locations relatively near one another.<sup>10</sup> It follows then that a “mass shooting” could be defined as a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and in one or more locations relatively near one another. Similarly, a “mass public shooting” could be, and has been,

<sup>9</sup> James Alan Fox and Jack Levin, *Extreme Killing: Understanding Serial and Mass Murder*, 3<sup>rd</sup> ed., Sage Publications, Inc. 2014, 344 pp. Hereinafter cited as “Fox and Levin, *Extreme Killing*, 201””; Grant Duwe, *Mass Murder in the United States: A History*, McFarland 2007, p. 27. Hereinafter cited as Grant Duwe, *Mass Murder in the United States: A History*, 2007; and U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *Homicide in the U.S. Known to Law Enforcement*, 2011, December 2013, NCJ 243055, by Erica L. Smith and Alexia Cooper, p. 14.

<sup>10</sup> John E. Douglas, Ann W. Burgess, Allen G. Burgess, and Robert K. Ressler, *Crime Classification Manual: A Standard System for Investigating and Classifying Violent Crime*, 2<sup>nd</sup> ed., Jossey-Bass 2006, p. 13. Hereinafter cited as Douglas, Burgess, Burgess, and Ressler, *Crime Classification Manual*, 2006; U.S. Department of Justice, Federal Bureau of Investigation, National Center for the Analysis of Violent Crime, Behavioral Analysis Unit, *Serial Murder: Multi-Disciplinary Perspectives for Investigators* (July 2008), p. 8, <http://www.fbi.gov/stats-services/publications/serial-murder/serial-murder-july-2008-pdf>. Hereinafter referred to as Federal Bureau of Investigation, *Serial Murder: Multi-Disciplinary Perspectives for Investigators* (July 2008); and Lin Huff-Corzine, et al., “Shooting for Accuracy: Comparing Data Sources on Mass Murder,” *Homicide Studies*, vol. 18(1), 2014, p. 106.



defined to mean a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, in one or more public locations, such as a workplace, school, restaurant, house of worship, neighborhood, or other public setting.<sup>11</sup>

The FBI profilers, notably, did not specifically address whether mass murder involved a single or multiple offenders, although in a majority of cases, mass murders involve a single offender. According to FBI profilers, a “classic mass murder” involves one person operating in one location at one period of time. They also noted “family mass murder” or “familicide” as a distinct form of mass murder. If a murderer (offender) committed suicide, the incident was labeled a murder-suicide. In this report, the definitions of three, overarching mass shooting patterns—mass public shooting, familicide mass shooting, and other felony mass shooting—mirror guidance provided by FBI profilers and other prominent criminologists. Under these definitions, offenders are not counted as victims.<sup>12</sup>

Mass shootings typically renew calls for passage of gun control legislation.<sup>13</sup> In response to the 2007 Virginia Tech massacre, for example, Congress passed the NICS Improvement Amendments Act of 2007 (P.L. 110-180), which addressed improving both federal and state electronic recordkeeping on persons ineligible to possess firearms under federal law due to past histories of mental illness or domestic violence. In response to the Newtown, CT, tragedy, the Senate considered gun control proposals, including amendments to P.L. 110-180, but tabled that legislation when a consensus could not be achieved.<sup>14</sup> In the House, similar proposals were introduced, but they were not considered in committee, nor did they reach the House floor for general debate.

Any mass shootings and subsequent calls to amend gun control laws will likely generate requests for comprehensive data on the prevalence and deadliness of these incidents. To these ends, this report provides data and analysis on mass shootings, that is, mass murders committed entirely with firearms, for a 15-year period (1999-2013) and mass public shootings for the 44-year period (1970-2013).<sup>15</sup> These datasets could possibly provide policymakers with additional vantage points from which to evaluate legislative gun control proposals that are often offered in the wake of particularly deadly mass public shootings.

<sup>11</sup> The term “mass public shooting” has been used by several researchers and commentators, but with different meanings and victim thresholds. Grant Duwe arguably first conclusively demonstrated that “mass public shootings,” as a pattern of homicidal behavior, increased in frequency during the 1970s, 1980s, and 1990s, in his book, *Mass Murder in the United States: A History*, 2007, p. 27.

<sup>12</sup> Out of 317 incidents of mass shootings from 1999 through 2013, CRS found one incident in which a mass murderer was killed by a civilian in a justifiable homicide with a firearm.

<sup>13</sup> For example, within a week of the August 1, 1966, University of Texas, Austin, tower shooting, President Lyndon B. Johnson called on Congress to pass gun control legislation. See Gary M. Laverne, *A Sniper in the Tower: The Charles Whitman Murders*, University of North Texas Press 1997, p. 268. See also Fox and Levin, *Extreme Killing*, 2014, pp. 287-293.

<sup>14</sup> See CRS Report R42987, *Gun Control Legislation in the 113<sup>th</sup> Congress*, by William J. Krouse, for discussion and analysis of legislation considered in response to the December 2012 Newtown, CT, mass shooting.

<sup>15</sup> This report complements an April 2013 CRS report that focused on federal public health and safety implications associated with “public mass shootings.” The current CRS report, however, adopts a slightly different definition of “mass shootings” that occur in public places that does not exclude incidents that can be attributed to terrorism or hate crime. The earlier report’s definition of “public mass shooting” excluded such incidents, because the motives of offenders in those cases could be viewed as a “means to an end,” the intimidation of some larger group of people, as opposed to “indiscriminate killing.” See CRS Report R43004, *Public Mass Shootings in the United States: Selected Implications for Federal Public Health and Safety Policy*, coordinated by Jerome P. Bjelopera.



## What Constitutes Mass Killings, Multiple Murder, Mass Murder, and Mass Shootings?

In the wake of tragedy in 2012 in Newtown, CT, Congress defined “mass killings” to mean “3 or more killings in a single incident” (P.L. 112-265; January 14, 2013). That definition does not make reference to a weapon.<sup>16</sup>

In the 1980s, the FBI established a system to classify multiple murder, mass murder, spree murder, and serial murder.<sup>17</sup> These efforts were led by the FBI Behavioral Science Unit (BSU)<sup>18</sup> and National Center for the Analysis of Violent Crime (NCAVC).<sup>19</sup> Both the BSU and NCAVC began documenting and studying multiple rapists and killers, as part of a wider process to research and analyze violent crime trends.<sup>20</sup> According to several criminologists, some of whom are retired FBI Special Agents previously assigned to the BSU, crimes can be classified by type, style, and victim counts.<sup>21</sup> Homicides, for example, have been traditionally classified by victim counts (or thresholds) as follows:<sup>22</sup>

*A single homicide* is one victim slain in one event.

*A double homicide* is two victims slain, in one event, in one location.

*A triple homicide* is three victims slain, in one event, in one location.

*A mass murder* is four or more victims slain, in one event, in one location.<sup>23</sup>

<sup>16</sup> Based on data provided to CRS by the Bureau of Justice Statistics, which are presented in **Appendix A** of this report, it can be extrapolated that the United States saw about 116 triple or greater homicide incidents per year on average from 1999 through 2011. Of those incidents, about 84 incidents were triple homicides and 32 were quadruple or greater homicides.

<sup>17</sup> Fox and Levin, *Extreme Killing*, 2014, p. 23.

<sup>18</sup> The BSU was established at the FBI in May 1972, as part of the FBI Academy. Through the BSU, the FBI trained and provided assistance to federal, state, and local law enforcement agencies in analyzing crimes, especially unsolved serial rape and murder cases. See Don DeNevi and John H. Campbell, *Into the Minds of Madmen: How the FBI's Behavioral Science Unit Revolutionized Crime Investigation* (2004), p. 79.

<sup>19</sup> The BSU-administered NCAVC was established at the FBI in 1984. In January 1986 the BSU was split into the Behavioral Science and Instruction and Research Unit (BSIRU) and the Behavioral Science Investigative Support Unit (BSISU). The former was charged with the traditional training mission of the BSU, as well as the research and development and training programs of the NCAVC. The latter was charged with offender profiling and consultative support and the Violent Criminal Apprehension Program (VICAP). See Robert K. Ressler, Ann W. Burgess, and John E. Douglas, *Sexual Homicide: Patterns and Motives* (1988), p. 102. Hereinafter referred to as Ressler, Burgess, and Douglas, *Sexual Homicide* (1988).

<sup>20</sup> Ibid, p. 236.

<sup>21</sup> Ibid, p. 138.

<sup>22</sup> Douglas, Burgess, Burgess, and Ressler, *Crime Classification Manual*, 2006, pp. 12-13.

<sup>23</sup> In a 2008 report on “serial murder,” the FBI National Center for the Analysis of Violent Crime and Behavioral Sciences Unit summarized a common understanding of the nature of “mass murder” that was held by many of the attendees at a 2005 national crime symposium:

Generally, mass murder was described as a number of murders (four or more) occurring during the same incident, with no distinctive time period between the murders. These events typically involved a single location, where the killer murdered a number of victims in an ongoing incident (e.g. the 1984 San Ysidro McDonalds incident in San Diego, California; the 1991 Luby's

(continued...)

A *spree murder* is two or more murder victims slain, in one event, in two or more locations, without the offender “cooling-off” emotionally between murders. The event, however, can be of short or long duration.

A *serial murder* is three or more separate homicidal events, with the offender cooling-off emotionally between homicidal events.<sup>24</sup>

In the view of FBI criminal profilers, a four-murder victim threshold constituted a “massacre.”<sup>25</sup> And, in this report, an offender is not included in the mass shooting victim counts, if he committed suicide, or was killed in a justifiable homicide.

In the *Crime Classification Manual*, FBI criminal profilers discuss two basic mass murder prototypes: “classic mass murder” and “family mass murder.” A classic mass murder commonly involves “a mentally disordered individual” whose problems have increased to the point that he acts out against groups of people who are unrelated to him or his problems.<sup>26</sup> The FBI criminal profilers pointed to the 1966 University of Texas, Austin, mass shooting as an example of a classic mass murder.<sup>27</sup> Sometimes, but not always, offenders in mass public shootings, which are discussed in this report, possibly fit this prototype. The FBI criminal profilers noted further that a classic mass murder event could last minutes, hours, or days.<sup>28</sup>

In addition, FBI criminal profilers identified family mass murder as a mass murder prototype, in which an offender murders four or more family members in one event and in one location.<sup>29</sup> Similarly, “familicide” is a term used to describe the murder of multiple family members, most commonly the murder of an intimate partner and children.<sup>30</sup>

These definitions with four victim thresholds, however, are not without limitations. For example, they do not capture mass murders in which three victims were shot to death, but additional victims were killed by means other than firearms.<sup>31</sup> Nor do such definitions capture murders in

(...continued)

Restaurant massacre in Killeen, Texas; and the 2007 Virginia Tech murders in Blacksburg, Virginia).

See U.S. Department of Justice, Federal Bureau of Investigation, National Center for the Analysis of Violent Crime, Behavioral Analysis Unit, *Serial Murder: Multi-Disciplinary Perspectives for Investigators* (July 2008), p. 8, <http://www.fbi.gov/stats-services/publications/serial-murder/serial-murder-july-2008-pdf>. Hereinafter referred to as Federal Bureau of Investigation, *Serial Murder: Multi-Disciplinary Perspectives for Investigators* (July 2008).

<sup>24</sup> Ibid, pp. 138-139. In the Protection of Children from Sexual Predator Act of 1998 (P.L. 105-314; October 30, 1998; 112 Stat. 2974, 2987), Congress defined “serial killings” to mean “a series of three or more killings, not less than one of which was committed within the United States, having common characteristics such as to suggest the reasonable possibility that the crimes were committed by the same actor or actors” (28 U.S.C. §540B(b)(2)). This provision authorizes the Attorney General and the FBI Director to investigate serial killings in violation of the laws of a state or political subdivision, if such investigation is requested by the head of a law enforcement agency with investigative or prosecutorial jurisdiction over the offense (see 28 U.S.C. §540B(a)).

<sup>25</sup> Fox and Levin, *Extreme Killing*, 2014, p. 23.

<sup>26</sup> Douglas, Burgess, Burgess, and Ressler, *Crime Classification Manual*, 2006, p. 113.

<sup>27</sup> Ibid.

<sup>28</sup> Ibid.

<sup>29</sup> Ibid.

<sup>30</sup> Marieke Liem, Jack Levin, Curtis Holland, and James A. Fox, “The Nature and Prevalence of Familicide in the United States, 2000-2009,” *Journal of Family Violence*, vol. 28, 2013, p. 351.

<sup>31</sup> On May 23, 2014, an offender murdered six people in Isla Vista, CA. He stabbed three victims, and shot three more (continued...)

which fewer than four victims were shot to death, but several victims were wounded, sometimes seriously.

It is also noteworthy that these FBI classifications of multiple homicides—double, triple, mass, spree, and serial—were largely conceptualized to aid law enforcement in investigations through criminal profiling and not for statistical data collection purposes.<sup>32</sup> When the cases of individual offenders are evaluated, there sometimes exists potential for overlap among these classifications, particularly for mass and spree murders, and less so for mass and serial murders.<sup>33</sup> Consequently, for statistical purposes, these classifications are not always mutually exclusive, which in some cases can present difficulties for researchers and can result in different judgments and varying findings with regard to the frequency and deadliness of these incidents.

According to one journal article, in 2010 the FBI adopted a revised definition of *mass murder*, that is, *murderous events resulting in at least four deaths normally taking place at one or more geographical locations relatively near one another*.<sup>34</sup> This revised definition indicates that the potential overlap between mass and spree murders is an issue that has been addressed. As demonstrated below, the definitions used in this report of three, overarching mass shooting patterns—mass public shooting, familicide mass shooting, and other felony mass shooting—mirror in part concepts and definitions developed by FBI profilers.

Notwithstanding FBI guidance, gun control and rights advocates, media outlets, law enforcement agencies, and academic researchers often adopt quite different definitions of “mass murder,” “mass shootings,” and “mass public shootings.”<sup>35</sup> As a result, their findings often vary.

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victims to death, before committing suicide by shooting himself. He shot and wounded at least two others and injured 11. He reportedly carried three semiautomatic pistols equipped with multiple ten-round magazines, all of which he had legally acquired under both federal and California state law. About a month prior to the shootings, he had exhibited disturbing online behavior that prompted his parents to call the police. However, when the police stopped by his apartment on a “welfare” stop, he was able to convince them reportedly that he was “depressed,” but posed no threat to anyone. He reportedly recognized that encounter with the police was a close call, for he had already purchased the three handguns and had already written a misogynistic diatribe outlining his plan to seek retribution against those who had allegedly mistreated and disrespected him. For further information, see Santa Barbara County Sheriff’s Office, *Isla Vista Mass Murder, May 23, 2014, Investigative Summary*, February 18, 2015, 68 pp.

<sup>32</sup> Robert K. Ressler, Ann W. Burgess, and John E. Douglas, *Sexual Homicide: Patterns and Motives* (1988), p. 140.

<sup>33</sup> For example, spree murderers have killed four or more persons at a single location, as well as additional victims at other locations. Thus, those spree murderers could also be classified as mass murderers, but only for that incident. And some spree murderers have killed four or more people at two or more locations within a single municipality or county within a time frame of comparatively short duration, such as less than 24 hours. These spree murderers could also be classified as mass murderers, if the two or more murder locations were comparatively close in proximity and, thus, could possibly be considered one location, and the murders a single incident. In October 2002, two offenders shot to death 10 victims and wounded 3 others in several incidents in the greater Washington, DC, area. On October 3, 2002, during a 14-hour period, however, they shot five of those victims to death from several concealed positions within Montgomery County, MD, and Washington, DC. For the purpose of this report, the murders on October 3, 2002, are considered a single mass public shooting. Out of 66 mass public shootings from 1999 to 2013, in addition to the April 20, 1999, Columbine, CO, mass shooting, the October 3, 2002, Washington, DC, area sniper (mass) shooting was the only other incident that involved more than one offender.

<sup>34</sup> Lin Huff-Corzine, et al., “Shooting for Accuracy: Comparing Data Sources on Mass Murder,” *Homicide Studies*, vol. 18(1), 2014, p. 113.

<sup>35</sup> For example, one researcher defined a “mass public shooting” to be any incident that “occurred in a public place and involved two or more people either killed or injured by the shooting.” See John R. Lott, Jr., *More Guns, Less Crime: Understanding Crime and Gun Control Laws* (University of Chicago Press, 2000), p. 100. Other researchers defined “mass shooting” to include any incident where three or more people are killed or injured. See Brady Campaign to (continued...)

Nevertheless, the four-victim threshold and other elements of the above definitions reflect a synthesis arguably of the most conclusive, academically rigorous research available on “mass murder.” That research is discussed immediately below.

## Mass Murder Counts Based on FBI Supplementary Homicide Reports

Despite the public trauma and outcry generated by mass public shootings, there is a dearth of comprehensive, authoritative data on multiple-victim homicide incidents, either committed wholly or partially with firearms. A handful of criminologists, statisticians, sociologists, and other researchers have analyzed the principal source of national homicide statistics that is compiled by the Department of Justice (DOJ) annually, as part of the FBI’s Uniform Crime Reports and Supplementary Homicide Reports (UCR-SHR).<sup>36</sup> From their analyses, the following observations and extrapolations can be made:

- DOJ’s Bureau of Justice Statistics (BJS) *estimated* that there were 987 four or more victim homicide incidents from 1980 to 2011, or an average 31 per year.<sup>37</sup> However, while the bulk of those incidents were mass murders, it is probable that some of those incidents were serial murders committed over extended time periods, or spree murders that lasted longer than roughly 24 hours.<sup>38</sup> For that 31-year period, four or more victim homicides incidents accounted for 0.19% of all murders and nonnegligent manslaughter incidents and 0.87% of all victims who perished in those incidents.<sup>39</sup>
- James Alan Fox and Jack Levin *estimated* that there were 927 mass murders, resulting in the deaths of four or more victims, from 1976 to 2011, or an average of 26 incidents per year, involving 4,330 victims.<sup>40</sup>
- Grant Duwe *found* that there were at least 649 mass murders, resulting in the deaths of four or more victims, from 1976 to 1999, or an average of 27 per year,

(...continued)

Prevent Gun Violence, *Mass Shootings in the United States Since 2005*, last updated December 14, 2012, <http://www.bradycampaign.org/sites/default/files/major-shootings.pdf>.

<sup>36</sup> The FBI began collecting monthly crime reports from city, county, and state law enforcement agencies in 1930. Today, as part of the UCR program, the FBI collects incident, victim, property, offender, and arrestee data for 22 crime categories. In 1976, the FBI began collecting SHRs to capture greater data on homicides, including the method of murder. For a discussion of “Data for Measuring Firearms Violence and Ownership,” see National Research Council, *Firearms and Violence: A Critical Review*, National Academies Press, 2005, p. 26. For a more in-depth discussion of the data, see James Alan Fox, *Uniform Crime Reports (United States): Supplementary Homicide Reports, 1976-2002*, Ann Arbor, MI: Inter-University Consortium of Political and Social Research, 2005, <http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/4179>.

<sup>37</sup> U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *Homicide in the U.S. Known to Law Enforcement*, 2011, December 2013, NCJ 243055, by Erica L. Smith and Alexia Cooper, p. 14.

<sup>38</sup> Some researchers have chosen to categorize spree murders that occur within a 24-hour window as “mass murders,” or “mass/spree murders.” See Hannah Scott and Katie Fleming, “The Female Family Annihilator: An Exploratory Study,” *Homicide Studies*, vol. 18(1), 2013, p. 63.

<sup>39</sup> Ibid.

<sup>40</sup> Fox and Levin, *Extreme Killing*, 2014, p. 163.



and 5.22 murder victims per incident.<sup>41</sup> Of those mass murders, firearms were used in 69% of the incidents, from which it could be extrapolated that about 448 of the 649 mass murder incidents were mass public shootings, or an average per year of 18.7 mass shootings. Duwe not only analyzed the FBI SHR data, but he *verified* that all the homicidal incidents reported to the FBI were recorded properly by state and local law enforcement agencies on the SHR form as multiple victim homicides.<sup>42</sup> He also supplemented his dataset with incidents not reported to the FBI, but reported in the press. In January 2013, Duwe provided the *Washington Post* with updated and slightly revised estimates of mass public shootings. On average annually, Duwe's data show that there were:

- 1.3 mass public shootings per year in the 1970s,
- 3.2 per year in the 1980s, and
- 4.2 per year in the 1990s.<sup>43</sup>
- According to *USA Today*, offenders committed roughly 242 mass murders, resulting in the deaths of four or more victims, from 2006 to 2013, or an average of 30.3 incidents per year, and 4.98 victims per incident. Mass shootings accounted for 21.5 incidents per year with 5.1 victims per incident. Another 1.25 mass murder incidents per year involved at least some firearms and resulted in 4.8 victims per incident. The remaining 7.5 mass murder incidents per year resulted in 4.3 victims per incident and did not involve firearms (for a small percentage of incidents (2.1%), the murder weapons were unknown).<sup>44</sup>

In the homicide incidents mentioned above, which resulted in the deaths of four or more victims, BJS, Fox and Levin, Duwe, and *USA Today* found that offenders used firearms to kill victims more often than any other means to murder people. A more detailed summation of their findings can be found in **Appendix A**.

## CRS Methodology and Patterns of Mass Murder and Mass Shootings

For this report, CRS has gathered and analyzed data on mass shootings for the 15-year period 1999 to 2013. Drawing on the work of James Alan Fox and Jack Levin, Grant Duwe, and Meghan Hoyer (and colleagues at *USA Today*), CRS took the following steps:

- analyzed the FBI SHR data, the nation's primary data source on murder and nonnegligent manslaughter in the United States;

<sup>41</sup> Grant Duwe, *Mass Murder in the United States: A History*, 2007, p. 23.

<sup>42</sup> In some instances, several individual homicides were misreported on the same SHR form as multiple victim homicides. In other instances, wounded victims are reported as murdered, making double and triple homicides appear to be quadruple or greater homicides.

<sup>43</sup> See Glenn Kessler, "Clinton's Gun Remark Is off the Mark," *Washington Post*, January 13, 2013, p. A02.

<sup>44</sup> "Explore the Data on U.S. Mass Killings Since 2006," *USA Today*, <http://www.usatoday.com/story/news/nation/2013/09/16/mass-killings-data-map/2820423/>.

- verified the mass murders reported to the FBI by checking press accounts and, when needed, consulted with the reporting police agencies themselves;
- cross-referenced this data with mass murders with firearms lists compiled by advocacy groups, media outlets, and law enforcement agencies;
- supplemented the SHR data with mass shootings reported in the press, but not reported to the FBI or previously compiled by other researchers;
- evaluated every incident based on victim-offender relationships, incident locations, and other pertinent event characteristics and circumstances; and
- found three broad patterns of mass shootings that could provide policymakers with improved vantage points from which to evaluate gun control proposals.

When it comes to mass murder with firearms, mass shootings in public places have dominated the national dialogue about gun violence, partly due to several mass public shootings in recent years (2007, 2009, and 2012) that resulted in double-digit victim counts. While others have used the term, Grant Duwe first conceptualized the idea of a mass public shooting as a “pattern” or “form” of mass murder in his book, *Mass Murder in the United States: A History* (2007) as it is most commonly understood today.<sup>45</sup> Duwe observed:

The mass murders that often capture the public’s imagination are those in which an offender publically guns down victims for no apparent rhyme or reason. Of the 250 incidents that took place from 1900 through 1999, 191 involved offenders who used firearms. Excluding those that occurred in connection with criminal activity such as robbery, drug dealing, and organized crime, there were 116 mass public shootings during the twentieth century.<sup>46</sup>

Duwe defined mass public shooting as “any incident in which four or more victims are killed publicly in a workplace, school, restaurant, or other public place with guns and within 24 hours.”<sup>47</sup>

As noted above, according to the *Crime Classification Manual*,<sup>48</sup> there are two basic types, or categories, of mass murder. There are “classic mass murders” and “family mass murders.” A “classic mass murder” is generally thought to involve one person operating in one location during one period of time, which could be minutes, hours, or even days. “The classic mass murder prototype is a mentally disordered individual whose problems have increased to the point that he acts out against groups of people who are unrelated to him or his problems.”<sup>49</sup> This profile sometimes, but not always, fits the profile of offenders involved in mass public shootings.

A “familicide” mass murder is generally agreed to involve an offender who kills four or more family members, most commonly a spouse or intimate partner and children. In this report, mass shootings involving the murder of family members by non-family members *are not* characterized as familicides. As demonstrated below, offenders in mass public shootings and familicide mass shootings often share some of the same attributes. For example, in mass public shootings and

<sup>45</sup> Grant Duwe, *Mass Murder in the United States: A History*, 2007, p. 27.

<sup>46</sup> Ibid.

<sup>47</sup> See Glenn Kessler, “Clinton’s Gun Remark Is off the Mark,” *Washington Post*, January 13, 2013, p. A02.

<sup>48</sup> Douglas, Burgess, Burgess, and Ressler, *Crime Classification Manual*, 2006, p. 13.

<sup>49</sup> Ibid.

familicide mass shootings, nearly all the offenders were lone assailants. Over half of the offenders in either type of mass murder committed suicide or were killed by responding police, when they resisted arrest. In many cases, the offenders had little or no practical expectation of escape.

When data on mass shootings were disaggregated, however, some mass shootings did not fit cleanly into either the classic mass murder or family mass murder pattern. A large percentage of these mass murders included gangland executions, drug-related home invasions and robberies, botched holdups, and other crimes. Others were arguments, romantic triangles, or barroom brawls that escalated into shootouts. In other words, some, but not all, of the mass shootings could be attributed to some other underlying felonious criminal activity or commonplace circumstance. These mass shooting incidents more frequently involved multiple offenders. While these offenders might not have considered the long-term implications of their crimes, they usually held out at least some expectation that they would not be discovered, arrested, and held accountable for their crimes.

Based on FBI guidance in part, Duwe, and others, CRS adopted the following parallel definitions for patterns of “mass murder” committed entirely with firearms:

- “mass shooting” means a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and in one or more locations in close geographical proximity;
- “mass public shooting” means a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and at least some of the murders occurred in a public location or locations in close geographical proximity (e.g., a workplace, school, restaurant, or other public settings), and the murders *are not* attributable to any other underlying criminal activity or commonplace circumstance (armed robbery, criminal competition, insurance fraud, argument, or romantic triangle);
- “familicide mass shooting” means a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and a majority of the victims were members of the offender’s immediate or extended family, the majority of whom were murdered in one or more private residences or secluded, sparsely populated settings in close geographical proximity, and the murders are not attributable to any other underlying criminal activity or commonplace circumstance (e.g., armed robbery, criminal competition, insurance fraud, argument, or romantic triangle); and
- “other felony mass shooting” means a multiple victim homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, in one or more locations in close geographical proximity, and the murders *are* attributable to some other underlying criminal activity or commonplace circumstance (e.g., armed robbery, criminal competition, insurance fraud, argument, or romantic triangle).

For the purposes of this report, CRS has chosen not to include any timeframe parameter for the mass shooting definitions discussed above, but it is noteworthy that most mass shootings typically lasted little more than several minutes. However, several prominent researchers,

including Duwe as seen above, have defined either “mass murder” or “mass public shooting” with a timeframe parameter of “24 hours.”<sup>50</sup>

As also noted above, the FBI has traditionally viewed “mass murders” as four or more murder victim multicides that occur in a single event or incident and single location, but a “single location” could be construed as a neighborhood, or even a distinct geographical area that might be situated in different but adjoining states. To address this possibility, the FBI reportedly changed its definition of “mass murder” to account for “murderous events” that occur in multiple locations that are geographically near one another.<sup>51</sup>

Along these lines, CRS has crafted its definition of mass public shooting with a scope wide enough to capture incidents that occurred in multiple locations (that is, incidents that occurred in both public and private locations), or neighborhood spree killings that involved several private residences in the same neighborhood, but belonging to different family units, yet might still be considered “public,” and a single event that occurred in one general location. Five of 66 mass public shootings in the CRS dataset could be characterized as four or more victim spree murders, or mass/spree murders.

In addition, CRS has also crafted its definition of mass public shooting narrowly enough to exclude mass shootings that occurred in remote or secluded, sparsely populated “public” places (e.g., parks, national forests, and rural back roads), where the likelihood of police intervention was low. In summation, CRS has generally characterized any mass murder with firearms as a mass public shooting, if four victims were shot to death and the incidents occurred wholly or partially in public spaces, except for those incidents that occurred in public, but comparatively secluded and sparsely populated locations.<sup>52</sup>

It is noteworthy that there is a number of mass public shootings in the CRS dataset—about one-fifth—that were possibly triggered by a domestic dispute, but either all or a majority of the victims were not related to the offender(s). Four other incidents, which were characterized as mass public shootings, could have also been characterized as familicides, in that the offender was a spouse or former intimate partner of one of the victims and the other victims were all, or nearly all, family members. These incidents were characterized as mass public shootings because they occurred in a roller rink, day spa, and two houses of worship.

In addition, family units were annihilated with firearms in some of the incidents included in the other felony mass shooting dataset; however, the offenders were generally rival drug dealers or gang members, or both, and were not related to the victims by blood, marriage, or other form of domestic union. Nearly all of the mass murders characterized as familicide mass shooting incidents in this report occurred in private residences or remote locations, and involved lone offenders who were either a family member or a former intimate partner of a family member. Notwithstanding the potential for overlap, it follows that there are conceptually at least three

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<sup>50</sup> Hannah Scott and Katie Fleming, “The Female Family Annihilator: An Exploratory Study,” *Homicide Studies*, vol. 18(1), 2014, p. 63.

<sup>51</sup> Lin Huff-Corzine, et al., “Shooting for Accuracy: Comparing Data Sources on Mass Murder,” *Homicide Studies*, vol. 18(1), 2014, p. 113.

<sup>52</sup> For example, CRS categorized a November 1973 Sioux Falls, SD, mass shooting as an other felony mass shooting even though it occurred in Gitchie Manitou State Preserve. Although the preserve is a public place, it is also a remote and sparsely populated setting. In this case, there were three offenders, who were brothers. They murdered two couples, raping both females, before shooting all four victims to death.



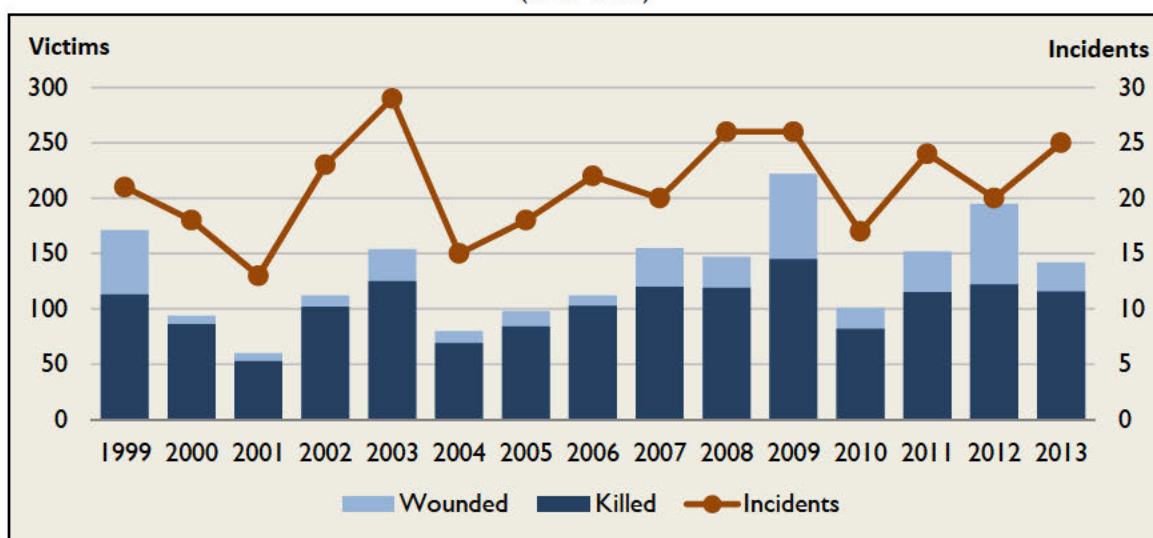
broad patterns of mass murder and, by extension, mass shootings: mass public shootings, familicide mass shootings, and other felony mass shootings.

CRS assigned individual incidents to only one of these three patterns after evaluating the specific location(s), offender-victim relationships, and other pertinent circumstances. Hence, the data subsets are mutually exclusive in this report. Other analysts and researchers could take the same datasets and make different distinctions, judgments, and findings. However, CRS categorized the incidents in this report based largely on the findings of other researchers with the objective of establishing as much comparability among studies as possible. While a handful of cases could possibly be placed in more than one category, like the four familicides in the mass public shooting category, most of the incidents fell within one of the three patterns outlined above.

## Mass Shootings Findings

As shown in **Figure 1**, CRS analysis of the FBI SHR and other data sources indicate that offenders committed at least 317 mass shooting incidents in the United States, murdering 1,554 victims and non-fatally wounding another 441 victims from 1999 through 2013.<sup>53</sup> During that 15-year period, there were on average 21 mass shooting incidents per year, with an average of 104 total murder victims and 29 wounded victims per year resulting from those incidents. As shown in **Table 1**, based on five-year averages, there was an uptick in mass shooting incidents and casualties during the last five years of the 15-year period. The annual incident and casualty counts shown in **Figure 1** and underlying **Table 1** are provided in **Table B-1**.

**Figure 1. Mass Shootings**  
(1999-2013)



**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

<sup>53</sup> Like BJS, Fox, and Duwe, CRS initiated its research by analyzing FBI SHR data. Like Duwe, CRS verified that quadruple and greater homicide incidents reported to the FBI were recorded properly by state and local law enforcement agencies on the SHR form and, then, supplemented the dataset with incidents not reported to the FBI.

**Notes:** “Mass shooting” means a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and in one or more locations in close geographical proximity.

**Table 1. Mass Shootings: Five-Year Annual Averages**

	Incidents	Victims Killed	Victims Wounded	Total Casualties
1999-2003	20.8	95.8	22.4	118.2
2004-2008	20.2	99.0	19.4	118.4
2009-2013	22.4	116.0	46.4	162.4

**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

**Notes:** “Mass shooting” means a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and in one or more locations in close geographical proximity.

In addition to providing overall data on “mass shootings,” this report builds on the work of noted criminologists and others, and provides statistical breakouts and further analysis for three broad patterns of mass shootings. In summary, those 21 mass shootings annually on average fall into the following broad patterns:

- four (4.4) were “mass public shootings” in which four or more victims were shot to death in one or more public locations, such as a workplace, school, restaurant, house of worship, or neighborhood, and the murders *were not* attributable to any underlying criminal activity or commonplace circumstance (e.g., armed robbery, criminal competition, insurance fraud, argument, or romantic triangle);
- eight (8.5) mass shootings were “familicides” in which a parent, former intimate partner, or less often a child (progeny), shot four or more victims to death, and a majority of those victims were murdered in private residences or secluded, sparsely populated settings, and the murders *were not* attributable to any underlying criminal activity or commonplace circumstance (e.g., armed robbery, criminal competition, insurance fraud, argument, or romantic triangle); and
- eight (8.3) mass shootings could be characterized as “other felony mass murders” in which victims were shot to death, and the murders *were* attributable to an underlying criminal activity or commonplace circumstance (e.g., armed robbery, criminal competition, insurance fraud, argument, or romantic triangle).

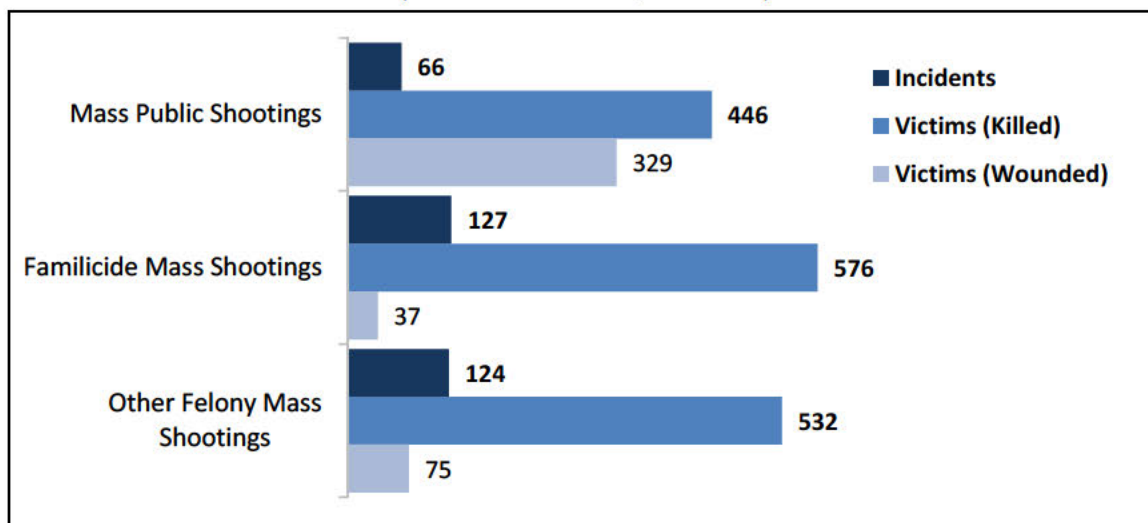
The 15-year dataset compiled by CRS indicates that the prevalence and deadliness of mass shootings overall fluctuated sporadically from year to year.<sup>54</sup> As discussed below, based on five-year averages, the data show that mass shootings increased slightly during the five-year period (2009-2013) compared to earlier five-year periods (1999-2003 and 2004-2008), suggesting an uptick in these incidents in recent years. Mass public shootings and familicide mass shootings also increased slightly, while other felony mass shooting incident and casualty counts decreased

<sup>54</sup> One study found that for the 36-year period 1976-2011 that the prevalence of mass shootings overall also varied considerably from year to year, but largely held steady at about 20 incidents per year on average over that time period. See James Alan Fox and Monica J. DeLateur, “Mass Shootings in America: Moving Beyond Newtown,” *Homicide Studies*, February 2014, p. 129, <http://dropbox.curry.com/ShowNotesArchive/2013/12/NA-576-2013-12-22/Assets/War%20on%20Crazy/Homicide%20Studies-2013.pdf>.

slightly, suggesting that the composition of mass shootings has possibly changed over that 15-year timespan (1999-2013). **Figure 2** shows the actual victim and casualty counts for public, familicide, and other felony mass shootings. Familicide and other felony mass shootings occurred twice as frequently as mass public shootings. Compared to familicide (4.8) and other felony mass shootings (4.9), public mass shootings accounted for twice the number of victims (killed and wounded) per incident (11.7).

**Figure 2. Mass Public, Familicide, and Other Felony Mass Shootings**

(Incidents and Victims, 1999-2013)



**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups

In consultation with Grant Duwe, CRS has re-evaluated his data on “mass public shootings” for the 1970s, 1980s, and 1990s. For example, CRS eliminated some of the Duwe-reported mass public shootings, because upon further examination some of those incidents could be characterized as other felony mass shootings.<sup>55</sup> Based on the CRS definition of “mass public shootings,” the data show there were on average:

- one (1.1) incident per year during the 1970s (5.5 victims murdered, 2.0 wounded per incident),
- nearly three (2.7) incidents per year during the 1980s (6.1 victims murdered, 5.3 wounded per incident),
- four (4.0) incidents per year during the 1990s (5.6 victims murdered, 5.5 wounded per incident),
- four (4.1) incidents per year during the 2000s (6.4 victims murdered, 4.0 wounded per incident), and

<sup>55</sup> For example, CRS categorized an unsolved September 1984, Detroit, MI, mass shooting involving a disputed dice game, and a January 1993 Palantine, IL, mass shooting (Brown’s Chicken and Pasta) that started out as a robbery, as other felony mass shootings.



- four (4.5) incidents per year from 2010 through 2013 (7.4 victims murdered, 6.3 wounded per incident).

These decade-long averages indicate that the prevalence, if not the deadliness, of mass public shootings has increased, but whether these increases constituted an “epidemic,” as some have argued, would be a matter of perspective. As the data show, the United States saw about four mass public shootings per year on average in the 1990s and 2000s. The first four years of this decade saw an uptick in both the prevalence and deadliness of those incidents.

In terms of deadliness, over the past half century, there have been 13 mass public shootings that resulted in comparatively high casualty counts in terms of double-digit (greater than nine) murder victim counts. Seven of those high-casualty mass public shooting incidents occurred in the past seven years, and resulted in over half of the murder victims and nearly half of the wounded associated with those 13 incidents. Two of those mass public shootings, the December 2012 Newtown, CT,<sup>56</sup> and the April 2007 Blacksburg, VA (Virginia Polytechnic Institute and State University, or VA Tech)<sup>57</sup> mass shootings, resulted in the highest death tolls on record.

## Mass Public Shootings

As shown in **Figure 3**, offenders committed 66 mass public shootings, murdering 446 victims and non-fatally wounding another 329 victims from 1999 through 2013. As with mass shootings generally for that 15-year period, the number of mass public shooting incidents (4.4 per year on average) increased and decreased with considerable variation from year to year. Meanwhile, the casualty counts in terms of killed and/or wounded per year increased for 1999, 2007, 2009, and 2012, due to several incidents that resulted in 10 or more victims killed and sometimes several times more wounded. The average and median age of victims killed was 39 years of age. Notably, the mode was 6 years of age, demonstrating the singularity of Newtown.

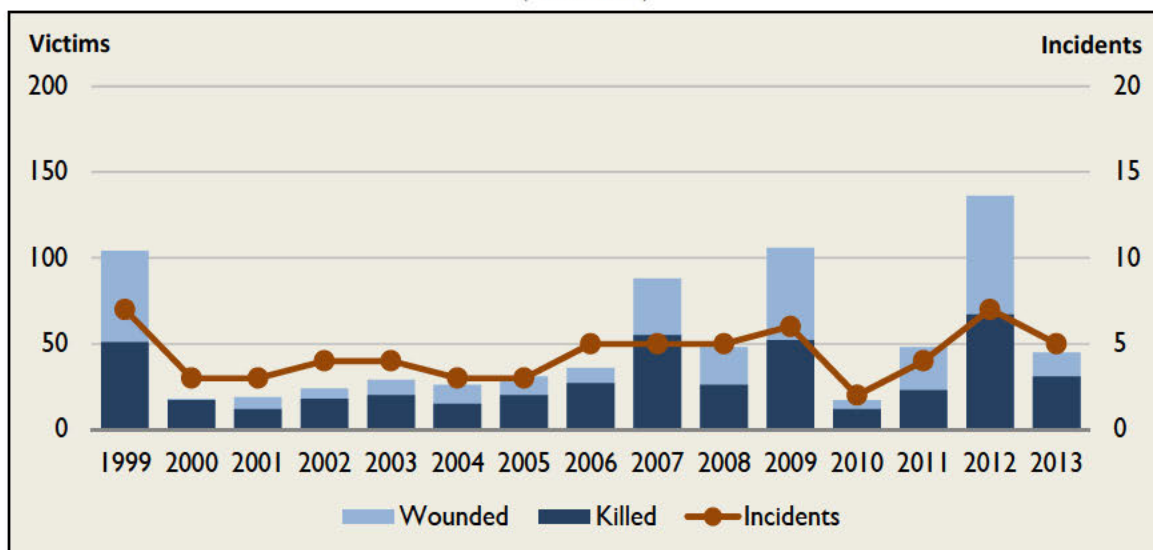
As shown in **Table 2**, five-year averages for both incident and victim counts were higher for the last five years than the preceding 10-year period (1999-2008). However, those increases were largely driven by a few incidents in 2012. If 2012 were excluded, the averages would actually have been lower than the preceding five-year period (2004-2008). The annual incident and casualty counts shown in **Figure 3** and underlying **Table 2** are provided in **Table B-2**.

<sup>56</sup> On December 14, 2012, in Newtown, CT, a 20-year-old male entered Sandy Hook Elementary School and shot 20 first graders and 6 adult staff members to death. He also shot his mother to death. For further information, see *Report of the State’s Attorney for the Judicial District of Danbury on the Shootings at Sandy Hook Elementary School and 36 Yogananda Street, Newtown, Connecticut on December 14, 2012*, November 25, 2013, 116 pp.

<sup>57</sup> On April 16, 2007, a student at Virginia Polytechnic Institute and State University shot 32 people to death and wounded many others. For further information, see *Mass Shootings at Virginia Tech, April 16, 2007: Report of the Virginia Tech Review Panel Presented to Timothy M. Kaine, Governor, Commonwealth of Virginia*, August 2007, 147 pp.



**Figure 3. Mass Public Shootings at Workplace, Schools, Restaurants, and Other Public Places**  
(1999-2013)



**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

**Notes:** “Mass public shooting” means a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and at least some of the murders occurred in a public location or locations in close geographical proximity (e.g., a workplace, school, restaurant, or other public settings), and the murders *are not* attributable to any other underlying criminal activity or commonplace circumstance (armed robbery, criminal competition, insurance fraud, argument, or romantic triangle).

**Table 2. Mass Public Shootings: Five-Year Annual Averages**

	Incidents	Victims Killed	Victims Wounded	Total Casualties
1999-2003	4.2	23.6	15.2	38.8
2004-2008	4.2	28.6	17.2	45.8
2009-2013	4.8	37.0	33.4	70.4

**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

**Notes:** “Mass public shooting” means a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and at least some of the murders occurred in a public location or locations in close geographical proximity (e.g., a workplace, school, restaurant, or other public settings), and the murders *are not* attributable to any other underlying criminal activity or commonplace circumstance (armed robbery, criminal competition, insurance fraud, argument, or romantic triangle).

Offenders used firearms that could be characterized as “assault weapons” in 18 of 66 incidents (27.3%), in that they carried rifles or pistols capable of accepting detachable magazines that might have previously fallen under the 10-year, now-expired federal assault weapons ban (1994-2004). In one of those incidents, the assault weapon had been illegally converted into a machine gun.<sup>58</sup> In another case, an off-duty police officer used a legally registered machine gun that had

<sup>58</sup> Under the 1934 National Firearms Act (NFA), the term “machine gun” is defined as any weapon which shoots, is (continued...)

been issued to him by his department.<sup>59</sup> In 38 incidents, the offender carried a single firearm. In 28 out of 66 incidents (42.4%), offender or offenders carried multiple firearms. At least seven offenders held concealed carry permits according to the Violence Policy Center.<sup>60</sup> None of the mass public shootings remained unsolved, unlike other felony mass shootings.

A domestic dispute of some type was allegedly a precipitating factor in roughly a fifth (21.2%) of “mass public shootings,” or at least 14 of the 66 incidents. Four other mass public shooting incidents could also be characterized as familicides, in that a spouse or former intimate partner murdered four or more family members, but in a public space. CRS categorized these incidents as mass public shootings for two reasons: they did not occur in secluded, sparsely populated locations, and other researchers had categorized these incidents as mass public shootings.<sup>61</sup> One mass public shooting could be characterized as terrorist attack: the November 5, 2009, Fort Hood, TX, mass shooting. Four other mass public shooting incidents included some element of racial or ethnic animus: those incidents occurred in a trailer park, work place, outdoors, and house of worship. The latter incident was the August 5, 2012, Oak Creek, WI, Sikh Temple mass shooting. In total, six out of 66 mass public shootings (9.1%) occurred in a house of worship. Seven

(...continued)

designed to shoot, or can be readily restored to shoot, automatically more than one shot, without manual reloading, by a single function of the trigger. The term also includes the frame or receiver of any such weapon, any part designed and intended solely and exclusively, or combination of parts designed and intended, for use in converting a weapon into a machine gun, and any combination of parts from which a machinegun can be assembled if such parts are in the possession or under the control of a person (26 U.S.C. §5845(b)). Enacted as part of the Internal Revenue Code, the NFA levies taxes on all aspects of the manufacture/importation and distribution of such firearms, and requires that these firearms and their owners be registered at every point the firearms change ownership in the chain of commerce.

By comparison, under the Gun Control Act (GCA) of 1968, the term “semiautomatic rifle” is defined as any repeating rifle which uses a portion of the energy of a firing cartridge to extract the fired cartridge case and chamber the next round, and which requires a separate pull of the trigger to fire each cartridge (18 U.S.C. §921(a)(28)). Semiautomatic pistol and rifle are similarly defined in the *Code of Federal Regulations* (27 C.F.R. §478.11).

On September 6, 2011, a 32-year-old male offender entered a Carson City, NV, restaurant and shot four people to death and wounded another seven with a 7.62mm Norinco Mak-90, which had been illegally converted from a semiautomatic rifle into a machine gun. Investigators reportedly recovered sixteen 30-round magazines. The offender reportedly emptied one magazine into the air before entering the restaurant and reloaded with two more magazines, firing 79 rounds in 1 minute and 25 seconds. Afterwards, the offender committed suicide with a .38 caliber revolver. According to press accounts, he had been diagnosed as a paranoid schizophrenic in 1999 and had been involuntarily committed once by police in California according to press accounts. See Martha Bellisle, “IHOP Shooting One Year Later: 85 Seconds That Changed Carson City,” *Reno Gazette-Journal*, September 3, 2012.

<sup>59</sup> On April 9, 2002, a 42-year old male offender and off-duty police officer used his department-issued MP5 machine gun in a Toms River, NJ, neighborhood shooting spree, or “mass public shooting,” in which he shot five people to death, before committing suicide. See Jean Mickle, “Killer Cop’s Victims’ Kin Get \$5.7M,” *Asbury Park Press (New Jersey)*, August 1, 2007.

<sup>60</sup> Violence Policy Center, *Concealed Carry Killers*, <https://www.vpc.org/ccwkillers.htm>.

<sup>61</sup> “A Guide to Mass Shootings in America,” *Mother Jones*. Mother Jones included at least two familicides committed in public places in its dataset. Those incidents included a March 1999 Gonzales, LA, church shooting and a February 2012 Norcross, GA, day spa shooting. In a previous report, CRS retained the church shooting in its dataset, but eliminated the day spa shooting. See CRS Report R43004, *Public Mass Shootings in the United States: Selected Implications for Federal Public Health and Safety Policy*, coordinated by Jerome P. Bjelopera.

In this report, CRS took an inclusive approach towards categorizing mass public shootings and categorized these incidents as Mother Jones did, with idea of establishing an initial dataset that could be as widely agreed upon as possible as a starting point for further analysis and debate about the nature of these incidents. CRS found two incidents that were very similar to these incidents, which are also included in this report’s mass public shootings dataset. They included a May 2006 Baton Rouge, LA, church shooting and a July 2011 Grand Prairie, TX, roller rink shooting.



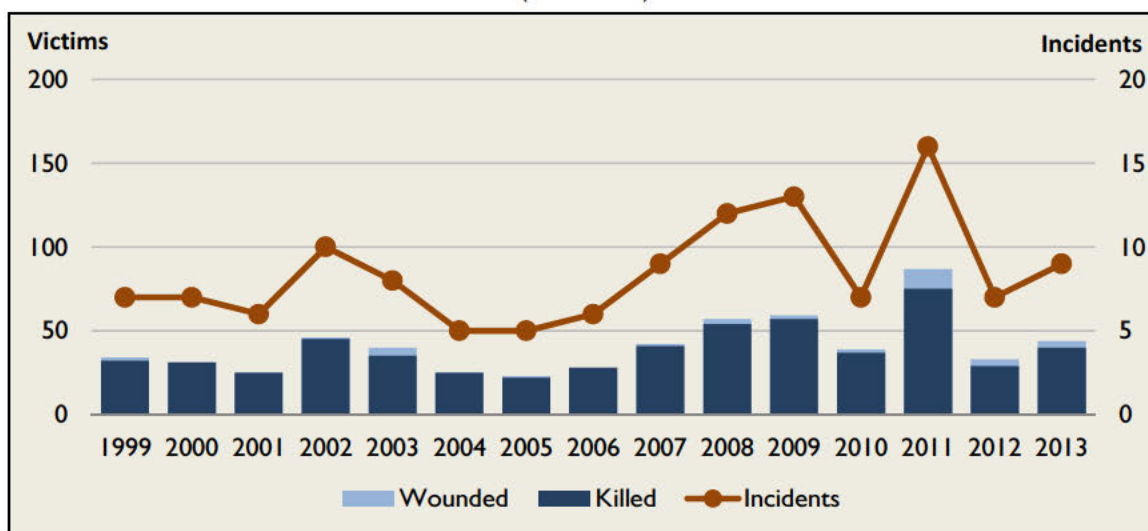
incidents (10.6%) occurred in schools or universities. Eighteen incidents (27.3%) occurred in workplaces.

Out of 68 offenders, 39 offenders committed suicide (57.4%), 8 were killed by police, 2 were wounded and then arrested, and the remaining 18 were arrested. One offender was female. All but two of these incidents involved single offenders. Those two incidents included the April 20, 1999, Columbine, CO, high school shooting and the October 3, 2002, Washington, DC, area sniper attacks. The average and median age of offenders was 36 years old, the mode was 42. Three offenders were juveniles (less than 18 years old), including the two co-conspirators in the Columbine, CO, and DC-area shootings.

## Familicide Mass Shootings

As shown in **Figure 4**, offenders committed 127 familicide mass shootings, murdering 576 victims and nonfatally wounding another 37 victims from 1999 through 2013. During that 15-year period, familicide mass shootings (8.47 incidents per year on average) occurred twice as frequently as mass public shootings. The average age of victims killed was 27 years old; median, 30; and mode, 1 or less than 1.

**Figure 4. Familicide Mass Shootings**  
(1999-2013)



**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

**Notes:** "Familicide mass shooting" means a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and a majority of the victims were members of the offender's immediate or extended family, the majority of whom were murdered in one or more private residences or secluded, sparsely populated settings in close geographical proximity, and the murders are not attributable to any other underlying criminal activity or commonplace circumstance (e.g., armed robbery, criminal competition, insurance fraud, argument, or romantic triangle).

As shown in **Table 3**, based on five-year averages, there was an increase in familicide mass shooting incidents and casualties during the last five years of the 15-year period. The annual incident and casualty counts shown in **Figure 4** and underlying **Table 3** are provided in **Table B-3**.

**Table 3. Familicide Mass Shootings: Five-Year Annual Averages**

	Incidents	Victims Killed	Victims Wounded	Total Casualties
1999-2003	7.6	33.6	1.6	35.2
2004-2008	7.4	34.0	1.0	35.0
2009-2013	10.4	47.6	4.8	52.4

**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

**Notes:** “Familicide mass shooting” means a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and a majority of the victims were members of the offender’s immediate or extended family, the majority of whom were murdered in one or more private residences or secluded, sparsely populated settings in close geographical proximity, and the murders are not attributable to any other underlying criminal activity or commonplace circumstance (e.g., armed robbery, criminal competition, insurance fraud, argument, or romantic triangle).

Out of 129 offenders, 72 offenders committed suicide (55.8%), five were killed by police, and 57 were arrested. Five offenders were female. Two incidents involved multiple (two) offenders. The average age of the offenders was 35.5 years, the median 35, and the mode 27. In one case, an offender used a firearm that could be characterized as an “assault weapon,” with which he murdered a single victim, his father.<sup>62</sup> He was 16 years old. In familicide mass shootings, most offenders (86.9%) carried and used a single firearm. Like mass public shootings, but unlike other felony mass shootings, none of the familicide mass shootings remained unsolved.

Most familicide mass shooting offenders were male heads of household or former domestic intimate partners. In a few cases, the offenders were progeny (sons), ex-boyfriends of daughters, or boyfriends with progeny co-conspirators (daughters). These incidents tended to occur late at night or in the early morning hours in private households. In such cases, there is arguably little expectation that the police will be able to intervene to prevent or end such shootings without greater loss of life. On the other hand, there have been cases where domestic violence restraining orders and the longevity of those restraining orders were an issue.<sup>63</sup>

## Other Felony Mass Shootings

As shown in **Figure 5**, offenders committed 124 other felony mass shootings, murdering 532 victims and non-fatally wounding another 75 victims from 1999 through 2013. During that 15-year period, like familicide mass shootings, other felony mass shootings (8.27 incidents per year

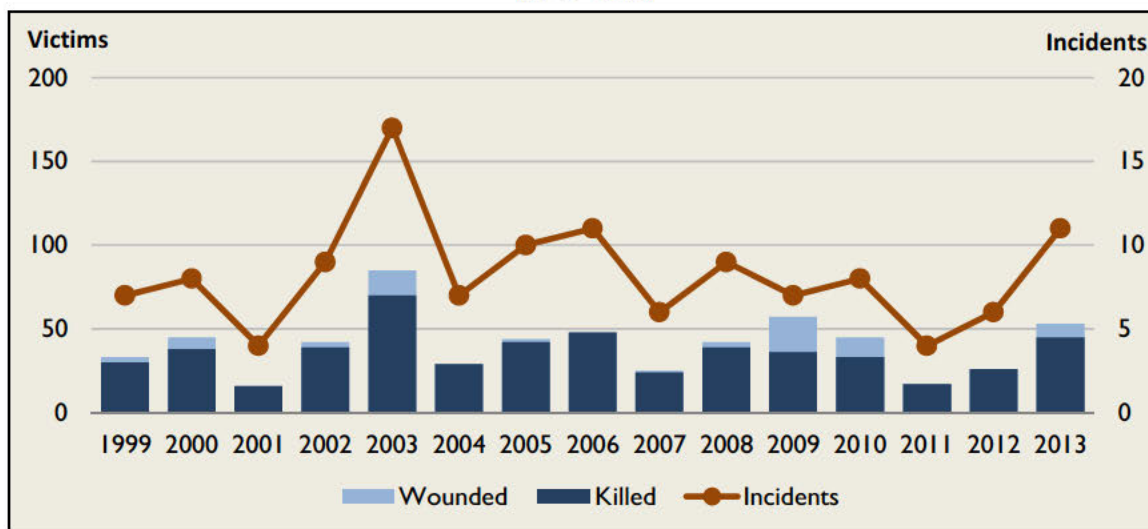
<sup>62</sup> On January 18 and 19, 2013, a 15-year-old male offender murdered four of his family members with a .22 caliber rifle and another, his father, with a semiautomatic AR-15-type rifle in Albuquerque, NM. According to documents charging the offender with murder and child abuse, the offender was “haunted by homicidal and suicidal thoughts that included fantasies of killing his girlfriend’s parents and gunning down random people at a Wal-Mart.” See Matt Pearce, “Nehemiah Griego’s Father Came Home to Family Massacre in New Mexico,” *Los Angeles Times*, January 23, 2013; and Susan Montoya Bryan and Jeri Clausing, “NM Teen Spent Day at Church After Family Slain,” *Associated Press Online*, January 24, 2013.

<sup>63</sup> For further information about state laws addressing firearms and domestic violence, see Shannon Frattaroli and Jan S. Vernick, “Separating Batterers and Guns: A Review and Analysis of Gun Removal Laws in 50 States,” *Evaluation Review*, vol. 30(3), 2006, pp. 296-312.



on average) occurred about twice as frequently as mass public shootings. The average age of the victims killed was 30 years; median, 26; and mode, 23.

**Figure 5. Other Felony Mass Shootings**  
(1999-2013)



**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

**Notes:** "Other felony mass shooting" means a multiple victim homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, in one or more locations in close geographical proximity, and the murders are attributable to some other underlying criminal activity or commonplace circumstance (e.g., armed robbery, criminal competition, insurance fraud, argument, or romantic triangle).

Unlike either mass public shootings or familicide mass shootings, as shown in **Table 4**, based on five-year averages, other felony mass shooting incidents and casualty counts generally decreased, with the exception of the wounded counts. The annual incident and casualty counts shown in **Figure 5** and underlying **Table 4** are provided in **Table B-4**.

**Table 4. Other Felony Mass Shootings: Five-Year Annual Averages**

	Incidents	Victims Killed	Victims Wounded	Total Casualties
1999-2003	9.0	38.6	5.6	44.2
2004-2008	8.6	36.4	1.2	37.6
2009-2013	7.2	31.4	8.2	39.6

**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

**Notes:** "Other felony mass shooting" means a multiple victim homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, in one or more locations in close geographical proximity, and the murders are attributable to some other underlying criminal activity or commonplace circumstance (e.g., armed robbery, criminal competition, insurance fraud, argument, or romantic triangle).

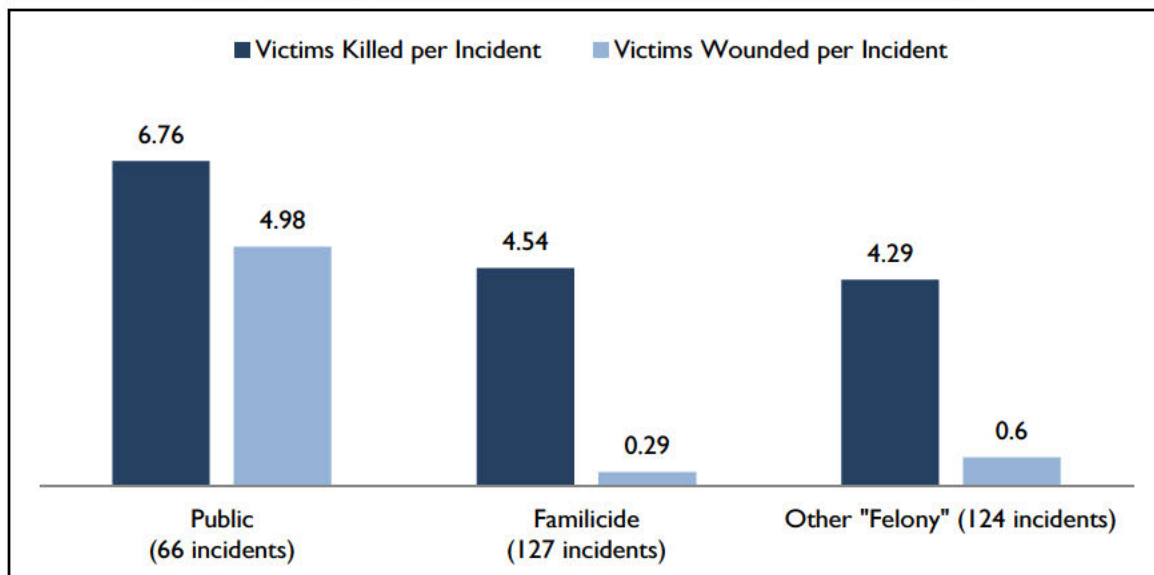
The average age of the offenders was 27.4 years, the median 26, and the mode 24. Seventy-seven of these 124 incidents (62.1%) were drug- or gang-related, and of those incidents, 31 were reportedly home invasions (25.0%). Fifteen were robberies (12.1%). Nine were classic revenge killings (7.3%). The rest ranged from a barroom shootout to courthouse escape. Out of 184 known or suspected offenders, three committed suicide, one was killed in an altercation with the police, and the rest were arrested. Most of those arrested were charged and convicted of murder or lesser crimes for being co-conspirators or accessories. Of these incidents, 40 involved single offenders; 30, two; 15, three; 9 four; 2, five; 1, six; and 1, eleven. Twelve offenders were female (all of them were co-conspirators). In 12 cases, offenders carried and/or used firearms that could be characterized as “assault weapons.” Based on available press accounts, 27 of these incidents remain unsolved.

## Comparative Summary Data and Figures

As shown in **Figure 6** and **Figure 7**, mass public shootings had the highest casualty rates whether killed or wounded per incident or per offender, when compared to familicides and other felony mass shootings. For those cases in which the offenders were identified, approximately half of other felony mass shooting incidents involved multiple offenders. As a result, the casualty rates per offender(s) were lower for other felony mass shootings than for either mass public shootings or familicides. All of the data used to construct the **Figure 6** and **Figure 7** are provided in **Table B-5**.

**Figure 6. Victims per Pattern of Mass Shooting Incident**

(317 incidents, 1,544 Murdered and 441 Nonfatally Wounded victims)

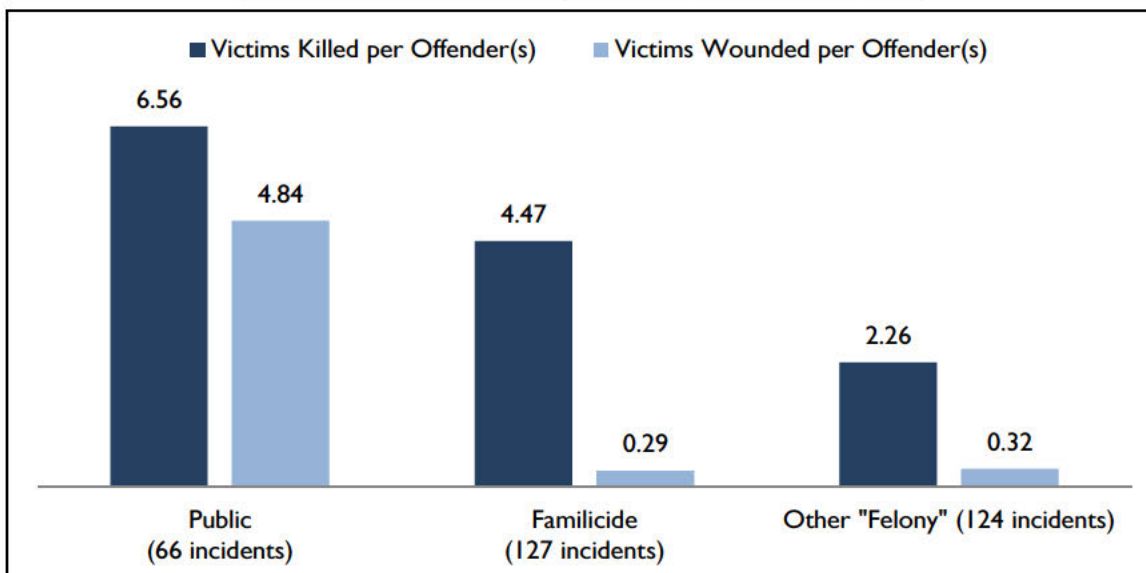


**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.



**Figure 7. Victims per Pattern of Mass Shooting Offender**

(At Least 432 Offenders Complicit in 317 Incidents, 1999-2013)



Source: CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

## Prevalence and Deadliness of Mass Public Shootings

Over the past 48 years, as shown in **Table 5**, there have been 13 mass public shooting incidents that resulted in comparatively high casualty rates, or double-digit death tolls (more than nine). Seven of those high-casualty mass shooting incidents occurred in the past seven years, and resulted in over half of the murder victims and nearly half of the wounded associated with those 13 incidents.

**Table 5. Mass Public Shootings with Double-Digit (>9) Death Tolls**

(Killed/Nonfatally Wounded)

Incidents (2007-2013)	Incidents (1966-2006)
2013 Washington Navy Yard (12/3)—workplace	1999 Littleton, CO (13/24)—high school
2012 Newtown, CT (27/2)—elementary school	1991 Killeen, TX (23/27)—other public space
2012 Aurora, CO (12/58)—other public space	1990 Jacksonville, FL (10/17)—public place
2009 Ft. Hood, TX (13/32)—workplace	1986 Edmond, OK (14/6)—workplace
2009 Binghamton, NY (13/4)—other public space	1984 San Ysidro, CA (21/19)—other public space
2009 Geneva County, AL (10/6)—private home and other public spaces (spree killing)	1966 Austin, TX (14/30)—university
2007 Blacksburg, VA (VA Tech) (32/17)—state university	
<b>Total:</b> Seven Years/Seven Incidents: 119 killed, 122 wounded	<b>Total:</b> Thirty-Four Years/Six Incidents: 95 killed, 123 wounded

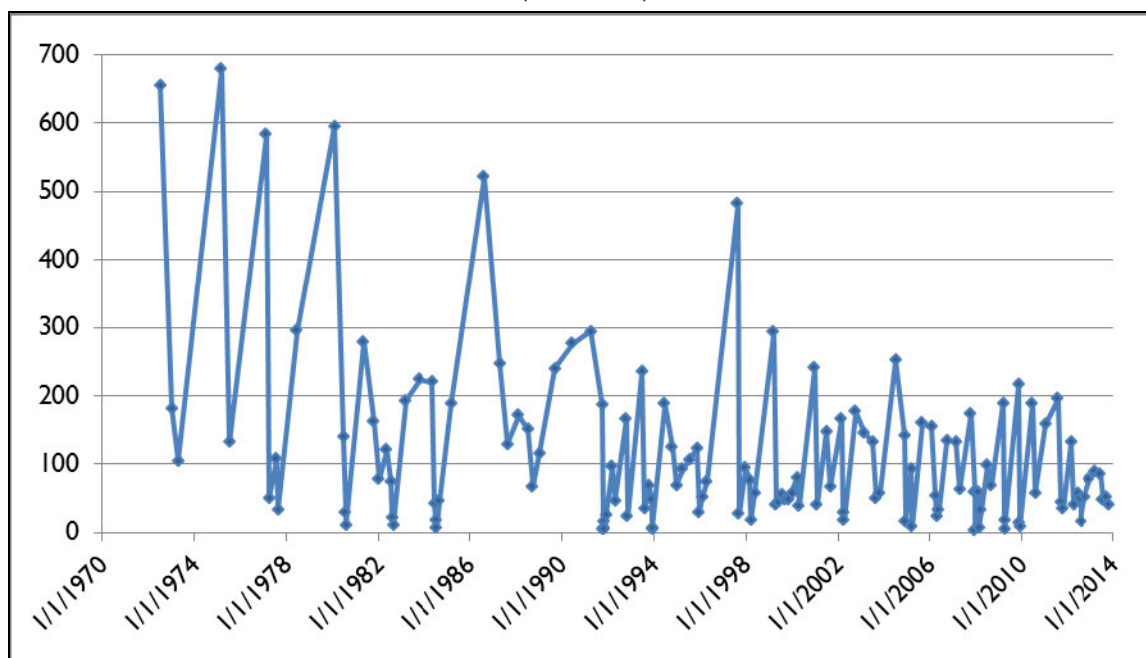
Source: Table adapted from James Allen Fox and Jack Levin, *Extreme Killing: Understanding Serial and Mass Murder*, 2<sup>nd</sup> Ed. (Sage Publications, Inc., 2012), p. 230.

**Notes:** Victim counts only include shooting victims. In some cases, additional victims were killed or wounded by means other than a firearm.

Two of those mass public shootings, the December 1992 Newtown, CT, and the April 2007 Blacksburg, VA (Virginia Polytechnic Institute and State University, or VA Tech) mass shootings, resulted in the two highest death tolls in the past half century. By comparison, for the earlier seven-year period (2000-2006), the United States did not suffer any mass shootings resulting in double-digit death tolls. And, over the 34-year period (1966-1999), there were six mass shooting incidents resulting in double-digit death tolls, and those incidents occurred less frequently.

As noted above, the current public understanding generally of what constitutes a mass public shooting was conceptualized arguably by Grant Duwe in his book, *Mass Murder in the United States: A History* (2007), although the term has been defined differently by several researchers.<sup>64</sup> Building upon Duwe's data and analysis, CRS compiled a 44-year dataset of firearms-related mass murders that could arguably be characterized as "mass public shootings." As shown in **Figure 8**, the days between incidents have become fewer over those years and the incidents have become more prevalent. From 2010 through 2013, for example, there were on average 74 days between mass public shooting incidents. For the 2000s, there were 88 days between incidents; for the 1990s, 94 days; for the 1980s, 152 days; and the 1970s, 282 days.

**Figure 8. Days Between Mass Public Shootings**  
(1970-2013)



**Source:** CRS analysis of data provided by Grant Duwe for 1970-1998 on mass public shootings, as well as analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups. This analysis is nearly identical to that which first appeared in Amy P. Cohen, Deborah Azrael, and Matthew Miller, "Rate of Mass Shootings Has Tripled Since 2011," Harvard Research

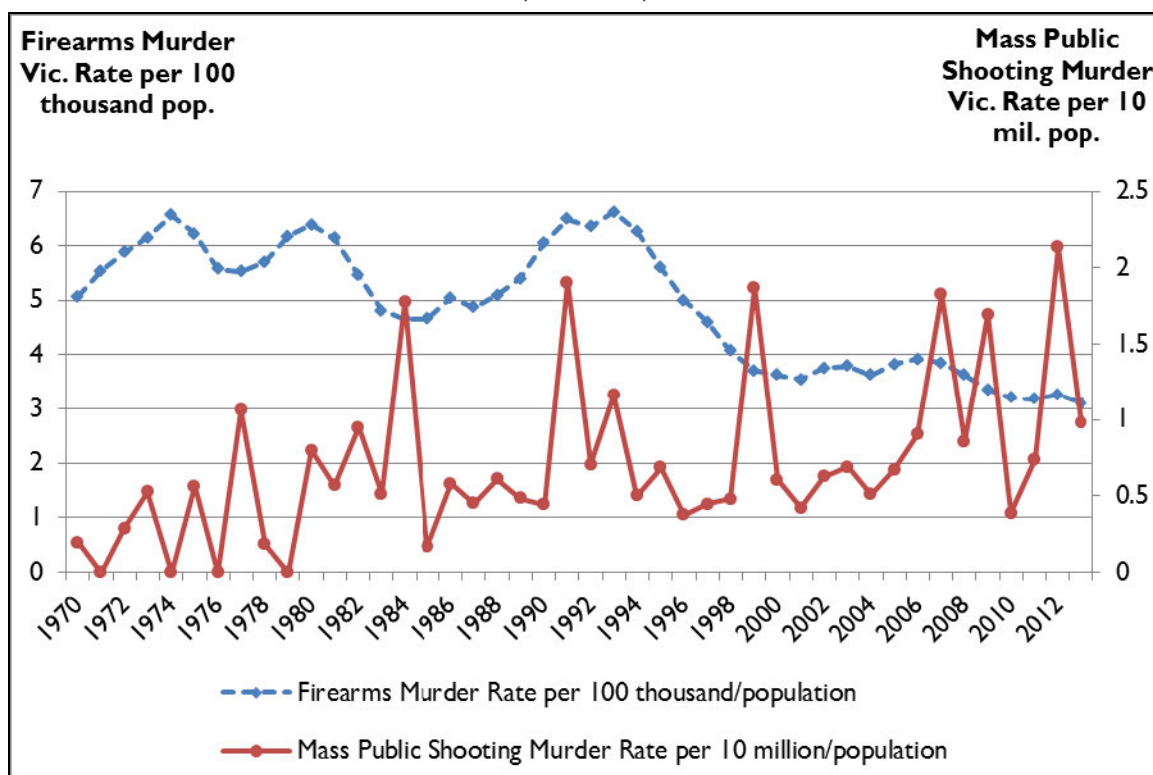
<sup>64</sup> See CRS Report R43004, *Public Mass Shootings in the United States: Selected Implications for Federal Public Health and Safety Policy*, coordinated by Jerome P. Bjelopera.



Shows," *Mother Jones*, October 15, 2014, except that the CRS/Duwe dataset is more comprehensive than the Mother Jones dataset.

As shown in **Figure 9**, the overall firearms-related murder victim rate increased in the 1970s, 1980s, and peaked in 1993. Since then, that murder rate has decreased, fluctuated moderately, or held steady for about the past two decades. From 1993 to 2013, the estimated firearms-related homicide victim rate per one hundred thousand of the population decreased from 6.62 to 3.10. By comparison, it was 5.07 per hundred thousand of the population in 1970 (see the left y-axis for scale). For the same years, the mass public shooting murder victim rate per ten million of the population has trended upward, notwithstanding annual sporadic fluctuations in those murder counts (see the right y-axis for scale). The mass shooting victim rates spiked in several years. For example, it spiked at one victim per 10 million of the population in 1977. It spiked at about one and three-quarter victims per 10 million of the population in 1984, 1991, 1999, 2007, and 2009, largely due to the high casualty incidents listed in **Table 5**. It spiked at over two per ten million of the population in 2012, a rate that principally reflects the victims of the Aurora, CO, and Newtown, CT, mass shootings.

**Figure 9. Firearm Murder and Mass Public Shooting Victim Rates**  
(1970-2013)



**Source:** CRS analysis of data provided by Grant Duwe for 1970-1998 on mass public shootings, as well as analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

## Possible Issues and Options for Congress

Mass shootings are arguably one of the worst manifestations of gun violence. Public perception of mass public shootings is largely shaped by media accounts.<sup>65</sup> Those accounts often depict mass public shootings as “random” incidents, in which victims are “gunned down indiscriminately.” Leading criminologists, however, have long disputed such characterizations of mass murders as overly simplistic, and have done so in the wake of the Newtown, CT, tragedy.<sup>66</sup> Those criminologists contend strongly that most mass murderers who kill with firearms carefully plan their attacks well in advance, know at least some of their victims, and often select their victims methodically.<sup>67</sup> Those criminologists contend further that while mass murderers are often afflicted with some form of severe emotional duress and mental instability and, consequently, are sometimes delusional, they are rarely psychotic and hallucinatory, and are seldom found to be criminally insane or otherwise unfit to stand trial.<sup>68</sup> In many cases, their mental conditions did not rise to a level such that they would have previously had significant encounters with either the mental health or law enforcement communities.<sup>69</sup> Criminologists have noted, moreover, that after a short period of “moral panic” the national attention that is generated by mass public shootings subsides and the affected communities return to normalcy.<sup>70</sup>

“Familicides,” by comparison, arguably do not garner the same level of media attention or public concern, even though those incidents occur twice as frequently as “mass public shootings.” Advocates for domestic abuse victims have observed that there is often a societal stigma attached to familicides, because the victims are sometimes seen to be indirectly to blame.<sup>71</sup> Instead of the fear, “It could be me,” as is the case in mass public shootings, there appears to be a counter-rationalization, “It would never happen to me.” In some cases, media coverage of familicides is sparse, maybe an article or two in a local paper, often with little or no statewide or national coverage. In addition, there is often little or no opportunity for law enforcement officers to intervene in the actual shootings, because these murders are typically committed late in the night or in the early morning hours in private residences or remote, isolated areas. As discussed below, however, several states have enacted laws to intervene proactively, by taking arguably more concrete steps to remove firearms from the homes of persons with histories of domestic violence.<sup>72</sup>

<sup>65</sup> Lin Huff-Corzine, et al., “Shooting for Accuracy: Comparing Data Sources on Mass Murder,” *Homicide Studies*, vol. 18(1), 2014, p. 113.

<sup>66</sup> James Alan Fox and Monica J. DeLateur, “Mass Shootings in America: Moving Beyond Newtown,” *Homicide Studies*, December 18, 2013, p. 126, <http://dropbox.curry.com/ShowNotesArchive/2013/12/NA-576-2013-12-22/Assets/War%20on%20Crazy/Homicide%20Studies-2013.pdf>.

<sup>67</sup> Ibid.

<sup>68</sup> Fox and Levin, *Extreme Killing*, 2014, pp. 288-289, and Michael D. Kelleher, *Flash Point: The American Mass Murderer*, Praeger, 1997, pp. 119-121.

<sup>69</sup> Ibid.

<sup>70</sup> Ronald M. Holmes and Stephen T. Holmes, *Mass Murder in the United States*, Prentice Hall, 2001, p. 31. (Hereinafter cited as Holmes and Holmes, *Mass Murder*, 2001.)

<sup>71</sup> B.E. Richie, “Stigma, Stereotypes, and Gender Entrapment: Violence Against Women and Poverty,” *Georgetown Journal on Fighting Poverty*, vol. 3(1), Fall 1995, p. 36.D

<sup>72</sup> Shannon Frattaroli and Jan S. Vernick, “Separating Batterers and Guns: A Review and Analysis of Gun Removal Laws in 50 States,” *Evaluation Review*, vol. 30(3), 2006, pp. 296-312.

By comparison, “other felony mass shootings” generally generate media coverage initially following their discovery, but that attention usually wanes over time, especially when the offenders are not quickly apprehended, arrested, and brought to trial. As described above, a significant percentage of those incidents are drug- or gang-related, or involve persons engaged in other risk-laden, illegal activities. Because of this, there is sometimes little collective sympathy in afflicted communities for the victims. As with “familicides,” there is also often little opportunity for police to intervene in the actual shootings as they occur. Other mass shooting incidents appear to pose a challenge for law enforcement and the judicial system in some communities, as indicated by the possibly 27 unsolved “other felony mass shootings” in the 15-year CRS dataset.

In addition, following any mass shooting, questions are often raised by the media, gun control advocates, and gun rights defenders, but seldom answered definitively and officially. Among those questions, the six most frequently asked include

- How did the offenders get their guns, legally or illegally?
- Did the offenders have a history of violence and/or mental illness?
- How many and what types of guns were carried and used?
- Did the gun types lead to higher victim counts in terms of both killed and wounded?
- Did the offenders hold valid, state-issued concealed carry permits and, if so, was concealed carry a factor in shootings?
- Did the shootings occur in designated “gun free zones”?

Questions such as these, if answered comprehensively and in a longitudinal fashion, could arguably inform the policymaking process, as well as provide first responders with valuable criminal intelligence. Toward those ends, several gun control issues related to mass shootings are discussed below.

## **Mass Killings, Mass Murder, Mass Shooting, and Related Definitions**

Following the Newtown, CT, mass shooting, Congress passed legislation that statutorily defines the term “mass killings” as “3 or more killings in a single incident.”<sup>73</sup> This act essentially authorizes the Attorney General and FBI Director, at the request of a state or local law enforcement official, to assist in the investigation of violent acts, including mass killings and attempted mass killings in schools, malls, or other public places and non-federal office buildings. The term “mass killings” as defined in this act with its three-victim threshold differs with previous FBI guidance on homicide types, and with the prior general practice of enumerating what constitutes “mass murder.” As discussed previously, a mass murder has been defined generally as a multiple homicide incident in which four or more victims are murdered—not including the offender(s)—within one event, and in one or more geographical locations relatively near one another.

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<sup>73</sup> Investigative Assistance for Violent Crimes Act of 2012 (P.L. 112-265; January 14, 2013; 126 Stat. 2435).

Given its definition of “mass killings” in P.L. 112-265, and as one step towards establishing a comprehensive statistical baseline in the future, Congress might want to consider whether it would be beneficial for the FBI or other governmental agency to provide a consistent, complementary set of definitions for terms like “mass murder,” “mass shooting,” and “mass public shooting,” so that such terminology is not conflated with terms like “active shooter,” “mass killing,” or “mass casualty event.” Several researchers have called for the development of a consensus definition for mass shootings, as one step towards stimulating and funding “epidemiologic research on this phenomenon.”<sup>74</sup>

## Federal Statistics and Mass Shootings

So far, with the exception of BJS, no federal agency has systematically analyzed multiple victim homicide incidents involving firearms in a comprehensive, authoritative manner. Yet the FBI-compiled Uniform Crime Reports (UCR) and its complementary Supplementary Homicide Reports (SHR) program provide the single, authoritative source of data on multiple victim homicides from which valid, academically peer-reviewed statistical baselines can, and have been, established by a handful of researchers. Nonetheless, the UCR-SHR data are fraught with several serious shortcomings, which could be alleviated if state and local law enforcement agencies reported data more regularly, and the FBI took additional steps to ensure the data were collected with greater accuracy. (See **Appendix A**, footnote 95.)

In addition to the FBI’s UCR-SHR program, the Department of Health and Human Services’ Centers for Disease Control and Prevention (CDC) also maintain a database on mortality and morbidity in the United States, including firearms-related homicides, suicides, and accidents. However, the CDC datasets are not published on as timely a basis as the UCR-SHR datasets; for any given year, the CDC data releases usually lag behind the FBI UCR-SHR data releases by a couple of years. Furthermore, the CDC datasets only include data on multiple victim homicides for those incidents that the FBI investigates as “international terrorist incidents.”<sup>75</sup>

In short, to provide an improved statistical baseline on mass murder and gun violence, Congress could examine possibilities of future improvements to both the CDC and FBI datasets, as a means of making both datasets more comprehensive, compatible, and complementary.

## Legal or Illegal Firearms Acquisition

Following any firearms-related multiple homicide, one of the questions that nearly always arises is, “How did the offender acquire his gun(s), legally or illegally?” This is a question that sometimes can be answered by federal authorities. The DOJ’s Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) administers a regulatory framework of recordkeeping under both the Gun Control Act of 1968 (18 U.S.C. Chapter 44, §921 et seq.) and the National Firearms Act of 1934 (26 U.S.C. §5801 et seq.) that often allows federal agents to trace a firearm from a federally licensed manufacturer or importer of that firearm to the first retail purchaser, and

<sup>74</sup> James M. Shultz, Siri Thoresen, Brian W. Flynn, Glenn W. Muschert, Jon A. Shaw, Zelde Espinel, Frank G. Walter, Joshua B. Gaither, Yanira Garcia Barcena, Kaitlin O’Keefe, and Alyssa M. Cohen, “Multiple Vantage Points on Mental Health Effects of Mass Shootings,” *Current Psychiatry Report* (2014) 16:469, p. 14.

<sup>75</sup> U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *The Nation’s Two Measures of Homicide*, July 2014, NCG 247060, <http://www.bjs.gov/content/pub/pdf/ntmh.pdf>.



possibly to the offender. In this way, the legality of the transfers in a firearm's chain of commerce can sometimes be established.

The release of raw, unfiltered firearms trace data to the public, however, is fraught with controversy, especially when the identities of federally licensed gun dealers who might not have broken any law are released.<sup>76</sup> On the other hand, knowing whether the offenders acquired their firearms legally or illegally would arguably inform the gun control debate. For example, if a majority of offenders who kill with firearms acquired those weapons legally, then a stronger argument possibly could be made for better recordkeeping on persons who are legally disqualified from being transferred a firearm for reasons of domestic violence or other documented violent behavior, among other possible changes in federal and state law. According to some assessments, however, it appears that some mass murders had little or no prior interaction with the mental health community, nor did they always have criminal history records.<sup>77</sup> While this could be said for some mass public shooting offenders, this observation is probably less valid for other felony and familicide mass shooting offenders.

Similarly, if a significant percentage of those offenders acquired those firearms from unlicensed persons, a stronger argument could be made for requiring "universal background checks," a proposal under which all firearms transfers would have to be made through a federally licensed gun dealer to ensure that a federal name-based background check would be conducted on all potential unlicensed firearms buyers, no matter whether the seller was a licensed dealer or unlicensed, private person. Opponents of universal background checks would possibly counter that offenders would manage to acquire a firearm through a "straw purchase" or some other illegal avenue.<sup>78</sup>

Nevertheless, such data on legality of such transfers, if collected comprehensively and without bias, could be released by ATF without compromising the identities of federally licensed gun dealers, who might have simply had the misfortune to transfer a firearm according to the law, but to a murderer. If a federally licensed gun dealer or unlicensed, private person transferred a firearm to a mass shooter illegally, it is likely he would be prosecuted to the fullest extent of the law.

Along these lines, Congress could consider requiring ATF to reach out affirmatively to offer assistance to any state or local law enforcement agency investigating any multiple victim

<sup>76</sup> For FY2004 and every year thereafter, Congress has included a proviso in the ATF salaries and expenses appropriations language that is known for its original sponsor, Representative Todd Tiahrt. This proviso prohibits ATF from using appropriated funding to make unfiltered trace data available to any parties other than domestic and foreign law enforcement (with greater restrictions in the latter case) and national security agencies. The language of the proviso exempts trace reports, which ATF has traditionally produced for statistical purposes and firearms trafficking trend analysis. For FY2012, Congress included "futility language" ("in the current fiscal year and in each fiscal year thereafter") in this rider, which appears to be intended to make it permanent law. See Consolidated and Further Continuing Appropriations Act, 2012; P.L. 112-55; November 18, 2011, 125 Stat. 552, 609-610; 18 U.S.C. 923 note.

<sup>77</sup> James Alan Fox, "Top Ten Myths About Mass Shootings," *Boston.com*, [http://www.boston.com/community/blogs/crime\\_punishment/2012/12/top\\_10\\_myths\\_about\\_mass\\_shoot.html](http://www.boston.com/community/blogs/crime_punishment/2012/12/top_10_myths_about_mass_shoot.html).

<sup>78</sup> A "straw purchase" occurs when an individual poses as the actual transferee, but he is actually acquiring the firearm for another person. In effect, he serves as an illegal middleman. As part of any firearms transfer from a federally licensed gun dealer to a private person, the GCA requires them to fill out jointly an ATF Form 4473. In addition, the gun dealer is required to verify the purchaser's name, address, date of birth, and other information by examining a government-issued piece of identification, most often a driver's license. Among other things, the purchaser attests on the ATF Form 4473 that he is not a prohibited person, and that he is the "actual transferee/buyer." Hence, straw purchases are known as "lying and buying for the other guy." Straw purchases are illegal under two provisions of the GCA (18 U.S.C. §§ 922(a)(2) and 924(a)(1)(D)).

homicide, no matter the circumstances, by offering to trace any firearms used in those incidents. Based on that assistance, Congress could also consider directing BJS and ATF to report formally to Congress about the frequency and deadliness of multiple victim homicides, and how the offenders acquired those firearms used in those incidents, especially for mass murders. ATF would arguably also be well positioned to report to Congress on arson- and explosives-related mass murders.

## **Types of Firearms Used in Mass Shootings**

Many observers agree that a rash of “mass public shootings” in the 1980s and early 1990s was a contributing factor that led to the enactment of a 10-year (1994-2004) federal ban on “semiautomatic assault weapons” that placed restrictions on certain “military style” firearms capable of accepting “detachable magazines,” a capability that arguably allows some firearms to be re-loaded more rapidly and fired more rapidly. As noted above between 1999 and 2013:

- In “mass public shootings,” offenders used firearms that could be characterized as “assault weapons” in 18 of 66 incidents (27.3%).
- In one “familicide mass shooting,” an offender used a firearm that could be characterized as an “assault weapon,” with which he murdered one of his four victims, his father.
- In 12 “other felony mass shootings,” offenders carried and/or used firearms that could be characterized as “assault weapons” (9.7%).

In summation, out of 317 “mass shootings,” offenders used firearms that could be characterized as “assault weapons” in 31 incidents (9.78%), or roughly 1 out of 10 incidents. In some, but not all, of these incidents, the capabilities of these firearms arguably led to higher victim counts in terms of both killed and wounded. In other incidents, however, like the familicide described above, the fact that the firearm used to kill one of the victims could be characterized as an “assault weapon,” does not arguably inform the gun control debate a great deal, because the offender did not fire multiple rounds with that firearm to murder multiple victims, nor did he reload.

If an authoritative and comprehensive dataset of types of firearms used, numbers of shots fired, and reloads made in mass shooting incidents could be established, Congress and other policymakers would arguably have an improved basis from which to assess proposals regarding the capacity of detachable magazines and semiautomatic firearms capable of accepting those magazines.

## **Domestic Violence and Mass Shootings**

A domestic dispute of some sort was allegedly a contributing factor in about a fifth of mass public shootings and arguably nearly all of the familicide mass shootings. In some cases, offenders were able to purchase a firearm, or allowed to keep firearms already in their possession, and commit mass murder, even though they had previously had domestic violence restraining orders filed against them, or had been convicted of misdemeanor domestic violence offenses, both prohibiting factors under federal law with regard to firearms possession and transfer. Such scenarios have

prompted some states to increase the longevity of domestic violence restraining orders.<sup>79</sup> These scenarios have also prompted other states to require judges and magistrates issuing domestic violence restraining orders to communicate affirmatively to the subject of a restraining order that if he or she possesses any firearms, they are henceforward, for the life of that restraining order, in illegal possession of those firearms and in violation of federal law.<sup>80</sup> Hence, they must at least temporarily surrender constructive possession of their firearms to a neutral third party. Other states require the subjects of those restraining orders to actually surrender any firearms that they possess to the authorities for the life of that restraining order. The laws in other states remain silent on such matters, according to a 2006 report.<sup>81</sup> As several researchers underscored, the expectation that subjects of restraining orders voluntarily relinquish their firearms is a potentially problematic aspect of both federal and state law.<sup>82</sup>

With regard to such matters, Congress could consider directing the Attorney General to establish guidelines for the handling of such matters at the state and local level. Congress might also want to consider revisiting the NICS Improvement Amendments Act of 2007 (P.L. 110-180) to explore possibilities to address the issues related to improving electronic information sharing on persons with documented histories of domestic violence with the FBI for the purposes of gun control.

## Mental Illness and Mass Shootings

Most mass murderers arguably suffered from some form of mental instability, at least temporarily.<sup>83</sup> Many offenders, however, who manage to shoot to death four or more victims are not psychotic or hallucinatory; consequently, they often have not had significant interaction with either the mental health or law enforcement community.<sup>84</sup> Nonetheless, following mass shootings, policymakers often propose providing increased funding to bolster a federally maintained computer file in the National Instant Criminal History Background Check System, in which the FBI maintains records on persons who are considered “mentally defective,” or too “mentally incompetent” or “mentally unstable” to be trusted with firearms. Prior to the enactment of the Brady Handgun Violence Prevention Act (Brady Act, P.L. 103-159), however, the United States collectively saw no reason to establish a paper record system or electronic database of persons who were too “mentally incompetent” for gun control or any other purpose.

Conversely, prior to the Brady Act, the federal government and the states (largely facilitated by the FBI) had collectively built a federated system, which in the 1970s was computerized and

<sup>79</sup> Legal Community Against Violence, *Regulating Guns in America: An Evaluation and Comprehensive Analysis of Federal, State and Selected Local Gun Laws* (2008), pp. 88-103.

<sup>80</sup> Ibid.

<sup>81</sup> Shannon Frattaroli and Jon S. Vernick, “Separating Batterers and Guns: A Review and Analysis of Gun Removal Laws in 50 States,” *Evaluation Review* (June 2006), pp. 296-312.

<sup>82</sup> Emily Rothman, Renee M. Johnson, and David Hemenway, “Gun Possession Among Massachusetts Batterer Intervention Program Enrollees,” *Evaluation Review*, vol. 30, no. 3, June 2006, p. 284.

<sup>83</sup> Adam Lankford, *The Myth of Martyrdom: What Really Drives Suicide Bombers, Rampage Shooters, and Other Self-Destructive Killers*, Palgrave Macmillan, 2013, pp. 107-126. Katherine Ramsland, *Inside the Minds of Mass Murderers: Why They Kill*, Praeger Publishers, 2005, pp. 145-146.

<sup>84</sup> Jennifer Skeem, Patrick Kennedy, John Monahan, Jillian Peterson, and Paul Appelbaum, “Psychosis Uncommonly and Inconsistently Precedes Violence Among High-Risk Individuals,” *Clinical Psychological Science*, vol. 1-10, 2015, p. 4; cited in Yasmin Anwar, “Psychotic Hallucinations, Delusions Rarely Precede Violence,” *Psychology and Psychiatry*, May 12, 2015, <http://medicalxpress.com/news/2015-05-psychotic-hallucinations-delusions-rarely-violence.html>.

linked telephonically, to share mostly serious felony-level criminal history record information (“rap sheets”). This federated computer record system is the Interstate Identification Index (III). While the number and quality of records in the III needed to be improved substantially to meet the objectives of the Brady Act, without it, the Brady Act would have largely been unfeasible.

At the same time, the Brady Act created a statutory impetus to develop a parallel computer system and databases for persons who authorities considered to be too mentally unstable to be trusted with a firearm, as well as computer files on drug addicts and abusers. To implement this part of the Brady Act, federal authorities are dependent upon the state authorities to gather and provide those records electronically to the FBI. While some states that had required computerized, firearms-related background checks prior to the Brady Act had begun to establish such record systems, some states had not and still have not established such systems. Because the impetus was top-down and not bottom-up, or grass roots, the onus was arguably on the federal government to lead a nationwide dialogue and build a national consensus with regard to the scope, reach, and maintenance of such record systems.

At the federal level, such a dialogue was held administratively among federal agencies. In 1997, the ATF, in consultation with other federal agencies, established a regulatory definition of “adjudicated mental defective” as one step towards the implementation of the Brady Act, which required federal background checks on unlicensed persons seeking to acquire firearms from federally licensed firearms dealers.<sup>85</sup> According to DOJ, however, some states have chosen not to provide the FBI with any records on persons who would fall under ATF’s definition of “adjudicated mental defective,” even when they have been:<sup>86</sup>

- found to pose a danger to themselves or others following a court-ordered psychiatric evaluation;
- committed to a mental institution;<sup>87</sup> or
- found to be criminally insane.

Before the Newtown, CT, mass shooting, federal courts did not provide records to the FBI on persons who had been found to be criminally insane, though those persons fell under the ATF definition of “adjudicated mental defective.” While this oversight has reportedly been addressed

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<sup>85</sup> Under 27 C.F.R. §478.11, the term “adjudicated as a mental defective” is defined to include a determination by a court, board, commission, or other lawful authority that a person, as a result of marked subnormal intelligence or a mental illness, incompetency, condition, or disease, (1) is a danger to himself or others, or (2) lacks the mental capacity to manage his own affairs. The term also includes (1) a finding of insanity by a court in a criminal case and (2) those persons found incompetent to stand trial or found not guilty by reason of lack of mental responsibility pursuant to articles 50a and 72b of the Uniform Code of Military Justice, 10 U.S.C. Sections 850a, 876(b).

This definition was promulgated by an ATF final rule (*Federal Register*, vol. 62, no. 124, June 27, 1997, p. 34634).

<sup>86</sup> U.S. Department of Justice, *Report to Congress Pursuant to Requirements of the NICS Improvement Amendments Act of 2007 (P.L. 110-180)*, July 1, 2010.

<sup>87</sup> Under current federal law, the term “committed to a mental institution” does not include voluntary admissions and would not apply to individuals voluntarily seeking treatment for CRS Report R43040, *Submission of Mental Health Records to NICS and the HIPAA Privacy Rule*, coordinated by Edward C. Liu. Following the 2012 Newtown, CT, tragedy, several states changed laws related to involuntary commitments and mandatory reporting. Jessica Rosenberg, “Mass Shootings and Mental Health Policy,” *Journal of Sociology & Social Welfare*, March 2014, vol. XLI, no. 1, p.10114.



by the Executive Office of the U.S. Attorneys and Administrative Office of the U.S. Courts, it may still warrant congressional attention.<sup>88</sup>

On the other hand, since 1998, the Department of Veterans Affairs (VA) has transferred to the FBI electronic records on any VA beneficiary who is found to be too mentally incompetent to handle his or her day-to-day affairs, prompting Congress to create an administrative appeals process so that those VA beneficiaries can petition to have their gun rights restored. In addition, as a condition of federal aid under the NICS Improvement Amendments Act of 2007 (P.L. 110-180), Congress requires that states establish similar administrative appeals processes. In some cases, the costliness of these appeals processes has prompted some states to forgo applying for federal grants under the act.<sup>89</sup> Meanwhile, Congress maintains a rider on the ATF annual appropriations, prohibiting that agency from considering any disabilities relief applications under federal statute from any other person ineligible to possess for any reason, because gun privileges had been restored to persons with criminal histories, some of whom later went on to commit subsequent crimes, and also for cost-saving purposes.<sup>90</sup>

The range of “mentally incompetent” or “mentally unstable” persons who could potentially fall under the ATF definition of “adjudicated mental defective” is wide in scope and will likely be costly to realize. Congress has already provided state and local governments with hundreds of millions of dollars to improve the accuracy and electronic access to disqualifying records for the purposes of gun control.<sup>91</sup> While the focus of those efforts initially was on felony-level criminal records, over the years resources have been increasingly devoted to determinations of mental incompetency, misdemeanor domestic violence convictions, and misdemeanor domestic violence restraining orders.

The maintenance of these records has considerable implications for the individuals who are the subjects of those records. It also has costs, not only to the federal government, but state and local governments, and possibly mental health care providers as well.<sup>92</sup> To ensure that at some point in the future such funding is provided and expended in the most efficacious manner possible, Congress could consider the scope of the federal definition of “adjudicated mental defective” and

<sup>88</sup> Phone conversation with Administrative Office of the United States Courts, Office of Legislative Affairs on February 15, 2015.

<sup>89</sup> “The limited amount of NIAA grant funds appropriated so far may, in some cases, have caused states to abstain from pursuing a relief from disabilities program based upon a simple cost-benefit analysis.” U.S. Department of Justice, *Report to Congress Pursuant to Requirements of the NICS Improvement Amendments Act of 2007 (P.L. 110-180)*, June 1, 2012, p. 14.

<sup>90</sup> For FY1993 and every year thereafter, Congress has included a proviso in the ATF S&E appropriations language that prevents that agency from using appropriated funds to consider applications for disabilities relief (i.e., reinstatement of an applicant’s right to gun ownership under 18 U.S.C. §925(c)) from individuals who are otherwise ineligible to be transferred a firearm.

<sup>91</sup> Under the National Criminal History Improvement Program (NCHIP), which was originally authorized under the Brady Act, Congress has appropriated nearly \$563 million to provide states with grants to improve criminal history recordkeeping. Similarly, for programs authorized under the 2007 NICS Improvement Amendments Act (P.L. 110-180), Congress has appropriated nearly \$64 million to provide states and tribal governments with grants to improve mental health and criminal history recordkeeping on persons who are deemed to be either “mentally defective” or committed to a mental institution, convicted of a domestic violence misdemeanor, or subject to a domestic violence restraining order.

<sup>92</sup> Jonathan M. Metzl and Kenneth T. MacLeish, “Mental Illness, Mass Shootings, and the Politics of American Firearms,” *American Journal of Public Health*, February 2015, vol. 105(2), p. 247; cited in Yasmin Anwar, “Psychotic Hallucinations, Delusions Rarely Precede Violence,” *Psychology and Psychiatry*, May 12, 2015, <http://medicalxpress.com/news/2015-05-psychotic-hallucinations-delusions-rarely-violence.html>.

what a national database of “mentally incompetent and unstable” individuals means to the United States for the purposes of gun control. The current definition of “mental defective” is wide enough in scope that it may be many years, or perhaps never at all, before a significant percentage of records on all the persons who potentially fall under the current definition of “adjudicated mental defective” are comprehensively collected and placed in a database for the purposes of federal gun control.<sup>93</sup> Congress might also want to consider revisiting the NICS Improvement Amendments Act of 2007 (P.L. 110-180) to explore possibilities to address issues related to improving the electronic information sharing on persons with histories of mental illness and instability, as well as drug and alcohol abuse, with the FBI for the purposes of gun control.<sup>94</sup>

## **Other Felony Mass Shootings and Unsolved Mass Murder Cases**

A significant percentage, more than a fifth, of “other felony mass shootings” appears to remain unsolved. As demonstrated above, for “other felony mass shootings,” 27 of 124 cases were unsolved according to available press accounts. While that represents a clearance rate of nearly four-fifths of those incidents (78.2%), it could be a source of concern for some policymakers that quadruple or greater homicides—particularly mass shootings—in any community in the United States could remain unsolved. As the data show, a large percentage of those incidents were drug- and/or gang-related and often occurred in communities blighted by high poverty and other social ills. As one of the worst manifestations of gun violence, Congress could explore the reasons why these “mass shootings” remain possibly unsolved. Is it a lack of resources and/or ineffective policing? Are witnesses and others with knowledge of these murders afraid to come forward, for fear that criminals will retaliate against them and their families? Are these unsolved “mass shootings” indicative of communities whose trust in the police has become so diminished over the years that those communities collectively show greater affinity with the murderers than the police? While there are no clear answers to these questions, multiple victim homicide rates and unsolved “mass shootings” could possibly be one factor that could help policymakers more effectively target federal law enforcement assistance and intervention into high-crime areas.

<sup>93</sup> One observer stated: “If you focus on mental illness, all you get is a huge number of false positives.” See John Nicoletti, “Active Shooters See Themselves As Avengers, Acting Upon a Real or Perceived Injustice,” in *Police Response to Active Shooter Incidents* (Police Executive Research Forum, March 2014), p. 29.

<sup>94</sup> For further information about proposals to expand firearms ineligibility criteria, see Consortium for Risk-Based Firearm Policy, *Guns, Public Health, and Mental Illness: An Evidence-Based Approach for Federal Policy*, December 11, 2013, 38 pp.

## Appendix A. Review of Research on the Prevalence of Multiple Homicides, Mass Murder, and Patterns of Mass Murder

A handful of criminologists, statisticians, sociologists, and journalists have evaluated the single, most comprehensive source of homicide data in the United States as a means to gauge the frequency and deadliness of multiple victim homicides and “mass murder” committed with firearms and other weapons.

### Bureau of Justice Statistics Estimates of Multiple Victim Homicides

Based on its analysis of the FBI-SHR data, the DOJ Bureau of Justice Statistics (BJS) has provided CRS with data on the prevalence of multiple victim homicide incidents (by firearms and all other means) and associated murder victim counts for the years 1980 through 2011. To keep BJS data parallel with CRS data presented in this report, the BJS data presented and discussed in the next two tables (and figures) below are only for 1999 to 2011. It is significant to note that BJS statistically weighted its estimates to account for non-reporting and other known Supplementary Homicide Report (SHR) data limitations.<sup>95</sup>

**Table A-1. BJS-Estimated Single, Double, Triple, or Four or More Victim Homicide Incidents**

13-Year Period, 1999 to 2011

Year	All Homicide Incidents <sup>a</sup>	Single Victim	% of total	Double Victim	% of total	Triple Victim	% of total	Four or More Victim	% of total
1999	14,682	14,022	95.51%	550	3.75%	72	0.49%	37	0.26%
2000	14,850	14,250	95.96%	504	3.39%	70	0.47%	26	0.18%

<sup>95</sup> The SHR are beset with several significant data limitations with regard to multiple victim homicides. First and foremost, some states and localities do not participate, do not participate fully, or participate intermittently in the SHR program. Second, federal and tribal law enforcement agencies do not participate at all in the SHR program. Third, the FBI does not exercise direct control over how data are submitted. As a result, some potential difficulties in evaluating SHR data include

- Several single victim murder incidents might be reported on the same form; hence, they appear to be a multiple murder incident;
- A single multiple homicide incident might be reported as several incidents, one for each victim; or
- A single incident might be reported as a multiple homicide, because wounded were misreported as killed.

Fourth, incidents are reported by month and year, and not the actual day of occurrence. Consequently, the recorded month and year sometimes reflect when the incident was reported and not when it actually occurred. Fifth, in some, but not all, cases, the SHR data do not reflect the final disposition of the case, since the reports are based on the opening of an investigation and do not necessarily reflect the closing of an investigation and final legal action (e.g., trial and conviction).

Year	All Homicide Incidents <sup>a</sup>	Single Victim	% of total	Double Victim	% of total	Triple Victim	% of total	Four or More Victim	% of total
2001	15,233	14,561	95.59%	571	3.75%	81	0.53%	20	0.13%
2002	15,340	14,630	95.38%	582	3.80%	93	0.60%	34	0.22%
2003	15,554	14,805	95.18%	612	3.94%	91	0.58%	46	0.30%
2004	15,331	14,666	95.66%	563	3.67%	72	0.47%	30	0.19%
2005	15,855	15,135	95.46%	596	3.76%	98	0.62%	26	0.17%
2006	16,384	15,656	95.56%	598	3.65%	89	0.54%	41	0.25%
2007	16,234	15,524	95.62%	596	3.67%	84	0.52%	30	0.19%
2008	15,577	14,872	95.47%	583	3.74%	86	0.55%	37	0.24%
2009	14,498	13,776	95.02%	613	4.23%	72	0.50%	37	0.25%
2010	13,910	13,250	95.25%	552	3.97%	80	0.58%	28	0.20%
2011	13,743	13,048	94.94%	564	4.10%	108	0.78%	24	0.17%
Totals <sup>b</sup>	197,191	188,195	95.44%	7484	3.80%	1096	0.56%	416	0.21%

**Source:** U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics.

**Notes:** The figures in this table are not actual incident counts. They are statistical estimates based upon Bureau of Justice Statistics analysis of Federal Bureau of Investigation (FBI) Supplementary Homicide Reports.

a. "All homicide incidents" include "murders and nonnegligent manslaughter."

b. Totals may differ from the sum of the components due to rounding.

As shown in **Table A-1**, for that decade, it can be extrapolated that there were on average approximately 32 four or more victim homicides per year from 1999 to 2011. Those four or more victim homicides accounted for about two-tenths of one percent (0.21%) of all incidents of murder and nonnegligent manslaughter for that decade.

**Table A-2. BJS-Estimated Single, Double, Triple, Four or More Homicide Victims**  
13-Year Period, 1999 to 2011

Year	All Homicide Victims <sup>a</sup>	Single Victim	% of total	Double Victim	% of total	Triple Victim	% of total	Four or More Victim	% of total
1999	15,522	14,022	90.34%	1,100	7.09%	217	1.40%	183	1.18%
2000	15,586	14,250	91.43%	1,007	6.46%	209	1.34%	119	0.77%



Year	All Homicide Victims <sup>a</sup>	Single Victim	% of total	Double Victim	% of total	Triple Victim	% of total	Four or More Victim	% of total
2001	16,037	14,561	90.79%	1,142	7.12%	244	1.52%	90	0.56%
2002	16,229	14,630	90.15%	1,165	7.18%	278	1.71%	156	0.96%
2003	16,528	14,805	89.57%	1,224	7.41%	272	1.65%	226	1.37%
2004	16,148	14,666	90.82%	1,127	6.98%	216	1.34%	140	0.87%
2005	16,740	15,135	90.41%	1,192	7.12%	294	1.75%	120	0.71%
2006	17,309	15,656	90.45%	1,195	6.90%	266	1.54%	191	1.10%
2007	17,128	15,524	90.63%	1,191	6.96%	253	1.48%	160	0.93%
2008	16,465	14,872	90.32%	1,165	7.08%	257	1.56%	171	1.04%
2009	15,399	13,776	89.46%	1,226	7.96%	217	1.41%	180	1.17%
2010	14,722	13,250	90.00%	1,105	7.50%	240	1.63%	127	0.86%
2011	14,612	13,048	89.30%	1,128	7.72%	323	2.21%	114	0.78%
Totals <sup>b</sup>	208,425	188,195	90.29%	14,967	7.18%	3286	1.58%	1977	0.95%

**Source:** U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics.

**Notes:** The figures in this table are not actual victim counts. They are statistical estimates based upon Bureau of Justice Statistics analysis of Federal Bureau of Investigation (FBI) Supplementary Homicide Reports.

a. "All homicide victims" include victims of "murders and nonnegligent manslaughter."

b. Totals may differ from the sum of the components due to rounding.

Correspondingly, as shown in **Table A-2**, for that 13-year period it can be extrapolated that there were on average approximately 152 murder victims per year associated with those four or more victim homicides, or about 4.75 victims per incident. Those victims accounted for 1.58% of all homicide victims for that 13-year period, which is an increase of less than one percent for the 32-year period (1980-2011). It is worth noting that, in addition to being mass murders, some of those four or more victim homicide incidents were "serial murders" and "spree murders" that extended past one event, or roughly 24 hours in the case of some spree murders.

For 2011, BJS estimated that about two-thirds (67.1%) of all homicides involved firearms, and about half (49.4%) of all homicides involved handguns.<sup>96</sup> Consequently, about one-sixth (17.7%) of murders involved firearms other than handguns. In addition, the percentage of murders committed with firearms increased for multiple victim homicides over similar homicides committed by some other means (e.g., stabbing, strangulation, bludgeoning, or arson). For example, for 2011, BJS estimated that about two-thirds (66.5%) of single victim homicides, more than three-quarters (77.3%) of double victim homicides, more than four-fifths (82.3%) of triple victim homicides, and more than nine-tenths (90.8%) of four or more victim homicides (possibly mass murders) involved at least some firearms.<sup>97</sup>

<sup>96</sup> U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *Homicide in the U.S. Known to Law Enforcement*, 2011, December 2013, NCJ 243055, by Erica L. Smith and Alexia Cooper, p. 14.

<sup>97</sup> Ibid.

For 2011, BJS estimated further that the percentage of multiple victim homicide incidents committed with rifles<sup>98</sup> or shotguns<sup>99</sup> (long guns), as opposed to handguns,<sup>100</sup> increased significantly as well. For that year, about one-quarter (25.3%) of double homicides, more than one-third (35.2%) of triple homicides, and nearly one-half (46.6%) of four or more victim homicides were committed with firearms other than a handgun.<sup>101</sup>

According to BJS, multiple murders and nonnegligent manslaughter incidents, in which an offender or offenders killed four or more victims, are arguably statistically infrequent, notwithstanding the trauma inflicted on the victims, their families, and society as a whole. Over the 13-year period (1999-2011), there were 416 such incidents, in which 1,977 victims perished. In other words, those incidents accounted for about two-tenths of a percent (0.21%) of all BJS-reported murders and nonnegligent manslaughter incidents, or about 32.0 incidents per year on average.<sup>102</sup> Murder victims in those incidents accounted for almost one percent (0.95%) of all BJS-reported murder and nonnegligent manslaughter victims, or 152 victims per year on average.<sup>103</sup> **Figure 1** demonstrates both the number of incidents and the number of victims attributable to multiple murder and nonnegligent manslaughter.

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<sup>98</sup> *Rifle* means a weapon designed to be fired from the shoulder that uses the energy of an explosive to fire only a single projectile through a rifled bore for each single pull of the trigger (18 U.S.C. §921(a)(7)).

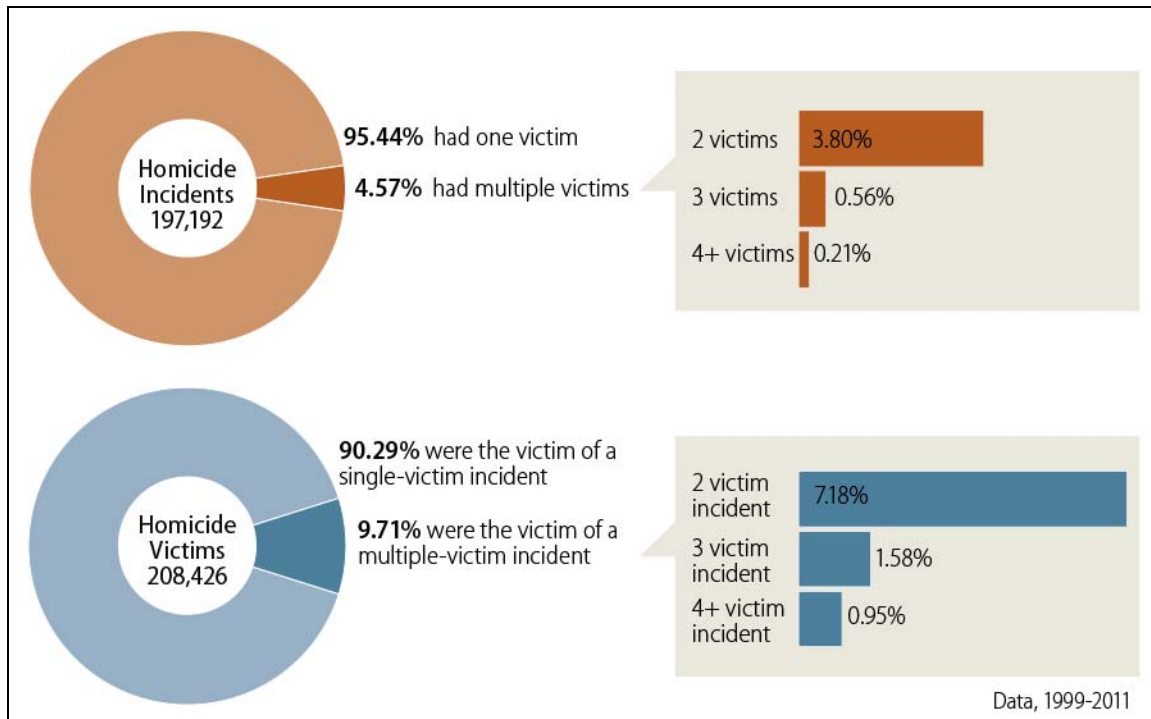
<sup>99</sup> *Shotgun* means a weapon designed to be fired from the shoulder that uses the energy of an explosive to fire through a smooth bore either a number of ball shot or a single projectile for each single pull of the trigger (18 U.S.C. §921(a)(5)).

<sup>100</sup> *Handgun* means (a) any firearm that has a short stock and is designed to be held and fired by the use of a single hand; and (b) any combination of parts from which a handgun can be assembled (18 U.S.C. §921(a)(29)).

<sup>101</sup> *Ibid.*

<sup>102</sup> U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *Homicide in the U.S. Known to Law Enforcement*, 2011, December 2013, NCJ 243055, by Erica L. Smith and Alexia Cooper, p. 14, <http://www.bjs.gov/content/pub/pdf/hs11.pdf>.

<sup>103</sup> *Ibid.*

**Figure A-1. Homicide Incidents and Victims by Total Victim Count, FY1999-2011**

**Source:** CRS analysis of data from the Bureau of Justice Statistics.

It is noteworthy that the BJS data includes all four or more victim murder and nonnegligent manslaughter incidents. Those four or more victim homicide incidents include both firearms and non-firearms-related homicides, although firearms were likely used in at least two-thirds and possibly as many as three-quarters of those incidents.<sup>104</sup> Also, those BJS-reported incidents possibly include spree and serial murders, which are often, but not always, distinct from mass murders. On occasion, they could also include vehicular murders and manslaughters.

Mass shootings make up a smaller percentage of murder and nonnegligent manslaughter incidents. For the 13-year period (1999-2011), CRS data show that at least 272 (0.14%) of the BJS-reported 197,191 murder and nonnegligent manslaughter incidents were mass shootings, accounting for 1,316 (0.63%) of the 208,425 homicide victims in those incidents. CRS analysis shows further that those “mass shooting” incidents could be characterized as follows:

- “Mass public shootings” accounted for 54 incidents (0.03%) and 348 victims slain (0.17%);

<sup>104</sup>As discussed above, data provided to CRS by the Department of Justice’s Bureau of Justice Statistics suggest that there were about 32 four or more victim homicide incidents per year in the United States for the 13-year period (1999-2011). Based on the *USA Today* dataset, moreover, for the eight-year period (2006-2013), it can be surmised that on average annually for that timespan offenders committed 30.25 mass murders, of which 21.5 were mass shootings, 1.13 were mass murders that were partially related to firearms, meaning some, but not all of the victims were murdered with firearms. Another 7.63 mass murders involved no firearms. Based on both datasets, it can be extrapolated that the United States sees about 30 mass murders per year for the past 30 years. Of those mass murders, it can be postulated that about three-quarters are possibly firearms-related.

- “Familicide mass shootings” accounted for 111 incidents (0.06%) and 507 victims slain (0.24%); and
- “Other felony mass shootings” accounted for about 107 incidents (0.05%) and 461 victims slain (0.22%).

Of the 416 BJS-reported four or more victim murder and nonnegligent manslaughter incidents, CRS data show that at least 272 incidents (65.38%) were mass shootings, in which at least four victims were shot to death with a firearm in a single incident. Those mass shooting murder victims accounted for 1,316 (66.57%) of the 1,977 victims of BJS-reported four or more victim murder and nonnegligent manslaughter incidents.

In addition, based on BJS-reported triple and four or more victim murders and nonnegligent manslaughter incidents for the 13-year period (1999-2011), it can be extrapolated that a dataset of three or more victim homicides would include about 116 incidents per year on average, which would include approximately 84 triple homicide incidents and 32 four or more victim incidents on average per year. Similarly, it can be extrapolated that a 13-year (1999-2011) dataset would include about 80 three or more victim homicide incidents per year committed entirely with firearms, of which at least 21 would be four or more victim mass shootings.

### ***Extreme Killing, by James Alan Fox and Jack Levin***

Two criminologists, James Alan Fox and Jack Levin, also analyzed FBI-SHR data and established estimates of the frequency of mass murder in the United States.<sup>105</sup> In 1985, Fox and Levin adopted the following definition: “mass murder consists of the slaughter of four or more victims by one or a few assailants within a single event, lasting anywhere from a few minutes to as long as several hours.”<sup>106</sup> Like BJS, Fox and Levin statistically weighted their estimates to account for non-reporting and other known SHR data limitations. Their methodology has been professionally and academically peer-reviewed.

Based on their analysis of the FBI-SHR data, as well as Florida state homicide reports, Fox and Levin estimated that there were 927 incidents of mass murder in the United States from 1976 to 2011, resulting in the murders of 4,330 victims.<sup>107</sup> Based on these estimates, it can be extrapolated that offenders committed 25.8 mass murders on average annually, killing about 4.7 murder victims per incident for that 36-year period. Of those mass murder incidents, an estimated 721 (77.8%) involved firearms.<sup>108</sup> In other words, Fox and Levin estimated that firearms were the offender “weapon of choice” in approximately 20 out of 26 mass murder incidents annually over that 36-year time period.<sup>109</sup>

Like the CRS 15-year dataset (1999-2013), however, the Fox and Levin 36-year dataset (1976-2011) indicated that the frequency of mass murders and mass shootings and their corresponding

<sup>105</sup> Fox was also instrumental in making those annual datasets available on the Internet through the University of Michigan’s Inter-University Consortium for Political and Social Research, <http://www.icpsr.umich.edu/icpsrweb/landing.jsp>.

<sup>106</sup> Fox and Levin, *Extreme Killing*, 2014, p. 162.

<sup>107</sup> Ibid, p. 163.

<sup>108</sup> Ibid, p. 165.

<sup>109</sup> Ibid, p. 165.



death tolls varied a good deal from year to year, but with no discernable, statistically significant tendency to increase or decrease over that time period, because the increases and decreases generally ranged within the error rate of roughly plus or minus five incidents.<sup>110</sup>

In their book *Extreme Killing*, Fox and Levin noted the challenges faced by researchers who had attempted to create mutually exclusive typologies or taxonomies of multiple murders or mass murderers based on factors like offender motive, incident location, or victim selection.<sup>111</sup> While they discussed at length profiles of mass murderers, such as “family annihilators,” “problem workers,” and “disgruntled students,” they refrained from providing statistical breakouts based on those profiles. On the other hand, they provided data for other characteristics like offender-victim relationships and circumstances (felony, argument, other), which have traditionally been delimited as part of the UCR-SHR program.

## **Mass Murder in the United States: A History, by Grant Duwe**

Criminologist Grant Duwe analyzed the FBI-SHR data for the years 1976 through 1999, and presented his findings in his 2007 book, *Mass Murder in the United States: A History*.<sup>112</sup> For that 24-year period, Duwe counted at least 649 mass murders, for an average of 27 mass murders per year.<sup>113</sup> Those mass murders on average resulted in an associated casualty rates of 5.2 murder victims and 4.31 wounded victims per incident.<sup>114</sup> Duwe also estimated that about 69% of those mass murder incidents involved firearms.<sup>115</sup> He estimated further that an “assault weapon” was used in about 3% of those 649 mass murder incidents.<sup>116</sup>

With regard to the FBI-SHR data, it is significant to note that Duwe identified 55 mass murders that were not reported to the FBI, but were reported in the press.<sup>117</sup> From the SHR data, moreover, he eliminated 71 cases that were not mass murders, either because they were inaccurately recorded (64), or were spree murders that occurred over a 24-hour period or serial murders (7).<sup>118</sup>

Duwe postulated that mass shootings in public spaces likely increased from 1966 through 1999. He labeled such mass shootings, “mass public shootings.” While he did not specifically define this term in his 2007 book, he later told the *Washington Post* that he defined “mass public shooting” to mean “any incident in which four or more victims are killed publically in a workplace, school, restaurant, or other public place with guns and within 24 hours.”<sup>119</sup> He postulated further that the frequency with which mass public shootings have occurred began to “accelerate” in the 1960s, and “accelerated rapidly” in the 1980s and 1990s.<sup>120</sup> Based on press

<sup>110</sup> Ibid, p. 163.

<sup>111</sup> Ibid, pp. 26-38.

<sup>112</sup> Grant Duwe, *Mass Murder in the United States: A History*, 2007.

<sup>113</sup> Ibid, p. 16.

<sup>114</sup> Ibid, p. 17.

<sup>115</sup> Ibid, p. 23.

<sup>116</sup> Ibid.

<sup>117</sup> Ibid, p. 189.

<sup>118</sup> Ibid.

<sup>119</sup> Glenn Kessler, “Clinton’s Gun Remark Is off the Mark,” *Washington Post*, January 13, 2013, p. A02.

<sup>120</sup> Grant Duwe, *Mass Murder in the United States: A History*, 2007, p. 27.

accounts, he found that there were 21 reported mass public shootings from 1900 through 1965.<sup>121</sup> Based on FBI-SHR data and press accounts, he counted 95 “mass public shootings” from 1966 through 1999. Of those incidents, 60 had occurred during the 20-year period 1980 through 1999.<sup>122</sup> Hence, for that 20-year period, there were roughly three mass public shootings per year.

According to the *Washington Post*, in January 2013, Duwe provided the newspaper with updated and slightly revised estimates of mass public shootings.<sup>123</sup> According to Duwe, there were

- six incidents of mass public shootings in the 1960s (1960-1969),
- 13 in the 1970s,
- 32 in the 1980s,
- 42 in the 1990s, and
- 28 in the 2000s.<sup>124</sup>

He reported further that there were 14 incidents from 2010 through 2012, but it was in his view too early to tell whether this trend would continue throughout the decade.<sup>125</sup> The year 1991 was the worst year with eight incidents of mass public shootings.<sup>126</sup> The years 1999 and 2012 were the second worst years with seven incidents per year.<sup>127</sup>

In addition to mass public shootings, Duwe identified five other historical patterns of mass murder:

- “workplace violence,”
- “familicides,”
- “felony-related massacres,”
- “gang-related massacres,” and
- “drug-related massacres.”

It is significant to note that, for Duwe’s data collection and reporting, these patterns are not mutually exclusive. For example, firearms-related “workplace violence” incidents could be a subset of “mass public shootings.” Similarly, “drug- and gang-related massacres” could be a subset of “felony-related massacres.”

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<sup>121</sup> Ibid.

<sup>122</sup> Ibid.

<sup>123</sup> Glenn Kessler, “Clinton’s Gun Remark Is off the Mark,” *Washington Post*, January 13, 2013, p. A02.

<sup>124</sup> Ibid. By comparison, the CRS mass shootings dataset indicates that there were at least 4.1 mass public shootings per year in the 2000s, and 4.5 per year so far in 2010s (through 2013). In consultation with Duwe, CRS also re-evaluated Duwe’s dataset for the 1970s, 1980s, and 1990s, and revised these decade-long averages slightly downward, by eliminating certain mass shootings, which upon further examination could be characterized as familicides or object-oriented other felony mass shootings.

<sup>125</sup> Ibid. CRS analysis of the SHR data, supplemented with press accounts, indicates that there were at least five public mass shootings in 2013, the most of deadly of which was the September 16, 2013, Washington, DC, Navy Yard shooting.

<sup>126</sup> Ibid.

<sup>127</sup> Ibid.

## **“Mass Killings,” by *USA Today***

In December 2013, *USA Today* ran an article on mass killings by Meghan Hoyer,<sup>128</sup> based on an eight-year dataset (2006-2013) that Hoyer had compiled and analyzed with her colleagues Mark Hannon, Paul Overburg, and Jodi Upton.<sup>129</sup> Like Duwe, Hoyer and her colleagues also verified the mass murders reported to the FBI by checking press accounts and police reports. In addition, they supplemented their data with mass murders reported in the press, but not reported to the FBI. According to Hoyer and colleagues, offenders committed roughly 242 mass murders, resulting in the deaths of four or more victims, during the eight-year period (2006-2013), or an average of 30.3 incidents per year, and 4.98 victims per incident.<sup>130</sup> Of those mass murders, on average annually:

- 21.5 incidents were “mass shootings” with 5.1 victims per incident,
- 1.25 incidents were “mass murders” with 4.8 victims per incident that involved at least some firearms, and
- 7.5 incidents were “mass murders” with 4.3 victims per incident and did not involve firearms (for a small percentage of incidents (2.1%), the murder weapons were unknown).<sup>131</sup>

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<sup>128</sup> Meghan Hoyer, “Behind the Bloodshed: In Mass Killings, One-Third of the Victims Are Kids,” *USA Today*, December 4, 2013, pp. 1A-2A.

<sup>129</sup> “Explore the Data on U.S. Mass Killings Since 2006,” *USA Today*, <http://www.usatoday.com/story/news/nation/2013/09/16/mass-killings-data-map/2820423/>.

<sup>130</sup> *Ibid.*

<sup>131</sup> *Ibid.*

## Appendix B. CRS-Verified Mass Shootings, Mass Public Shootings, Familicides, and Other Felony Mass Shootings Data Tables

The tables **B-1** through **B-7** include the data represented in **Figures 1-7** above in the body of this report.

**Table B-1. Mass Shootings**  
(1999-2013)

YEAR	Incidents	Killed	Wounded	Total Casualties	% Killed	%Wounded
1999	21	113	58	171	66.1%	33.9%
2000	18	86	8	94	91.5%	8.5%
2001	13	53	7	60	88.3%	11.7%
2002	23	102	10	112	91.1%	8.9%
2003	29	125	29	154	81.2%	18.8%
2004	15	69	11	80	86.3%	13.8%
2005	18	84	14	98	85.7%	14.3%
2006	22	103	9	112	92.0%	8.0%
2007	20	120	35	155	77.4%	22.6%
2008	26	119	28	147	81.0%	19.0%
2009	26	145	77	222	65.3%	34.7%
2010	17	82	19	101	81.2%	18.8%
2011	24	115	37	152	75.7%	24.3%
2012	20	122	73	195	62.6%	37.4%
2013	25	116	26	142	81.7%	18.3%
TOTAL	317	1554	441	1,995	77.9%	22.1%

**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

**Notes:** “Mass shooting” means a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and in one or more locations in close geographical proximity.



**Table B-2. Mass Public Shootings at Workplace, Schools, Restaurants, and Other Public Places**  
(1999-2013)

YEAR	Incidents	Killed	Wounded	Total Casualties	% Killed	%Wounded
1999	7	51	53	104	49.0%	51.0%
2000	3	17	1	18	94.4%	5.6%
2001	3	12	7	19	63.2%	36.8%
2002	4	18	6	24	75.0%	25.0%
2003	4	20	9	29	69.0%	31.0%
2004	3	15	11	26	57.7%	42.3%
2005	3	20	11	31	64.5%	35.5%
2006	5	27	9	36	75.0%	25.0%
2007	5	55	33	88	62.5%	37.5%
2008	5	26	22	48	54.2%	45.8%
2009	6	52	54	106	49.1%	50.9%
2010	2	12	5	17	70.6%	29.4%
2011	4	23	25	48	47.9%	52.1%
2012	7	67	69	136	49.3%	50.7%
2013	5	31	14	45	68.9%	31.1%
TOTAL	66	446	329	775	57.5%	42.5%

**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

**Notes:** “Mass public shooting” means a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and at least some of the murders occurred in a public location or locations in close geographical proximity (e.g., a workplace, school, restaurant, or other public settings), and the murders *are not* attributable to any other underlying criminal activity or commonplace circumstance (armed robbery, criminal competition, insurance fraud, argument, or romantic triangle).

**Table B-3. Familicide Mass Shootings**  
(1999-2013)

YEAR	Incidents	Killed	Wounded	Total Casualties	% Killed	%Wounded
1999	7	32	2	34	94.1%	5.9%
2000	7	31	0	31	100.0%	0.0%
2001	6	25	0	25	100.0%	0.0%
2002	10	45	1	46	97.8%	2.2%
2003	8	35	5	40	87.5%	12.5%
2004	5	25	0	25	100.0%	0.0%
2005	5	22	1	23	95.7%	4.3%
2006	6	28	0	28	100.0%	0.0%
2007	9	41	1	42	97.6%	2.4%

*Mass Murder with Firearms: Incidents and Victims, 1999-2013*

YEAR	Incidents	Killed	Wounded	Total Casualties	% Killed	%Wounded
2008	12	54	3	57	94.7%	5.3%
2009	13	57	2	59	96.6%	3.4%
2010	7	37	2	39	94.9%	5.1%
2011	16	75	12	87	86.2%	13.8%
2012	7	29	4	33	87.9%	12.1%
2013	9	40	4	44	90.9%	9.1%
TOTAL	127	576	37	613	94.0%	6.0%

**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, and agency press releases, and other compilations by mass media and advocacy groups.

**Notes:** “Familicide mass shooting” means a multiple homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, and a majority of the victims were members of the offender’s immediate or extended family, the majority of whom were murdered in one or more private residences or secluded, sparsely populated settings in close geographical proximity, and the murders are *not* attributable to any other underlying criminal activity or commonplace circumstance (e.g., armed robbery, criminal competition, insurance fraud, argument, or romantic triangle).

**Table B-4. Other Felony Mass Shootings**  
(1999-2013)

YEAR	Incidents	Killed	Wounded	Total Casualties	% Killed	%Wounded
1999	7	30	3	33	90.9%	9.1%
2000	8	38	7	45	84.4%	15.6%
2001	4	16	0	16	100.0%	0.0%
2002	9	39	3	42	92.9%	7.1%
2003	17	70	15	85	82.4%	17.6%
2004	7	29	0	29	100.0%	0.0%
2005	10	42	2	44	95.5%	4.5%
2006	11	48	0	48	100.0%	0.0%
2007	6	24	1	25	96.0%	4.0%
2008	9	39	3	42	92.9%	7.1%
2009	7	36	21	57	63.2%	36.8%
2010	8	33	12	45	73.3%	26.7%
2011	4	17	0	17	100.0%	0.0%
2012	6	26	0	26	100.0%	0.0%
2013	11	45	8	53	84.9%	15.1%
TOTAL	124	532	75	607	87.6%	12.4%

**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, and agency press releases, and other compilations by mass media and advocacy groups.

**Notes:** “Other felony mass shooting” means a multiple victim homicide incident in which four or more victims are murdered with firearms—not including the offender(s)—within one event, in one or more locations in close geographical proximity, and the murders are attributable to some other underlying criminal activity or

commonplace circumstance (e.g., armed robbery, criminal competition, insurance fraud, argument, or romantic triangle).

**Table B-5. Patterns of Mass Shootings and Associated Casualty Rates by Incident and Offender(s), 1999-2013**

<b>Mass Shooting Categories</b>	<b>Incidents</b>	<b>Offenders</b>	<b>Killed</b>	<b>Wounded</b>	<b>Killed per Incident</b>	<b>Wounded per Incident</b>	<b>Killed per Offender(s)</b>	<b>Wounded per Offender(s)</b>
Public	66	68	446	329	6.8	5.0	6.6	4.8
Familicide	127	129	576	37	4.5	0.3	4.5	0.3
Other "Felony"	124	235	532	75	4.3	0.6	2.3	0.3
Total	317	432	1,554	441	4.9	1.4	3.6	1.0

**Source:** CRS analysis of FBI Supplementary Homicide Reports, press accounts, agency press releases, and other compilations by mass media and advocacy groups.

## Author Contact Information

William J. Krouse  
Specialist in Domestic Security and Crime Policy  
wkrouse@crs.loc.gov, 7-2225

Daniel J. Richardson  
Research Assistant  
drichardson@crs.loc.gov, 7-2389

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